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# American Medicine

—

Edited

by

H. Edwin Lewis, M. D., and Charles E. Woodruff, M. D.

Volume XX., Complete Series

Volume IX., New Series

JANUARY — DECEMBER

1914



American Medical Publishing Company,  
Burlington, Vt., and New York, N. Y.

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**AMERICAN MEDICAL PUBLISHING CO.**

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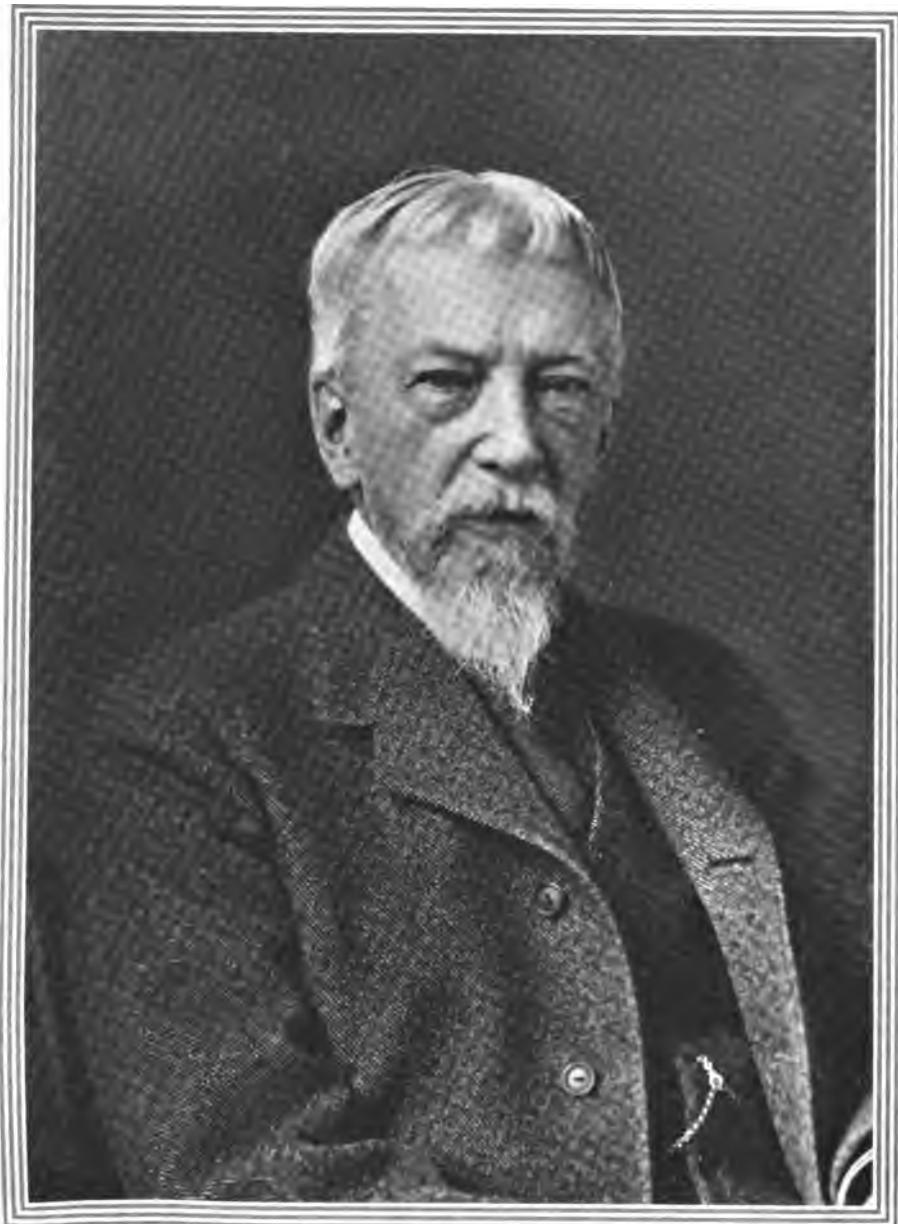
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S. WEIR MITCHELL,  
Born 1829—Died 1914.

# American Medicine

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and

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PUBLISHED MONTHLY BY THE AMERICAN-MEDICAL PUBLISHING COMPANY.

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Complete Series, Vol. XX, No. 1.  
New Series, Vol. IX, No. 1.

JANUARY, 1914.

\$1.00

YEARLY  
in advance.

**The contradictions of insanity experts** have been again flaunted to public ridicule in the Schmidt case, and the wonder grows that the alienists themselves do not put a stop to a practice which is discrediting the whole medical profession as well as themselves. The pity of it all is the fact that the hypothetic question on which an opinion is based, may be so framed as to make it impossible for the expert to express the true conclusions of his own examination of the criminal and study of the evidence of the crime. The alienists on both sides may be in close accord on essentials though differing in details as all men do, and yet the jury and public think the two sides are hopelessly irreconcilable. The total effect is the same as though no experts were called at all. In this trial a new departure was made in discrediting some experts by showing that they had been absolutely wrong in a previous trial. We hope this will be the rule hereafter, for it will soon result in restricting such testimony to those who have never blundered. At present judges are compelled to inform the jury that "expert" opinions may be ignored and that each juror must use "common sense" in determining whether the accused is, insane. This is a sad outcome of all the scientific study devoted to psychiatry, for it is now practically thrown out of court. A layman utterly ignorant of the science is considered to have a more valuable opinion than the

experts who have spent a lifetime in this special work. In fact the accused's life is in their hands and they must ignore one set of alienists or the other or both.

**Insanity Need Not Be Proved At The Trial.**—The public is uncompromising in its opinion that murderers must be put where they cannot kill anyone else. It is immaterial, as far as the protection of society is concerned, whether the confinement shall be in jail or hospital. It is not necessary to decide immediately which one it shall be. Indeed, it may require weeks or months of careful examinations to make a correct diagnosis. If the crime is one which calls for the execution of the criminal, and competent alienists express doubts as to his sanity, let them have time to come to a really scientific conclusion. Let us suggest as we have done before, that to prevent mistrials the jury should be first limited to deciding from the evidence whether or not the accused committed the act as charged. After they have rendered this verdict, the question of justification, provocation or responsibility may be opened by the court. Clear cases of self-defense could then be acquitted of punishment, the others sentenced according to the degree of provocation, and if insanity is alleged by competent experts the case can be remanded for further observation and the facts determined later by another jury of

laymen or experts employed by the court. This secondary inquiry would be undertaken at once if the insanity is unmistakable. Confinement of insane murderers would necessarily be for life, and the welfare of society will be properly guarded. The public will no longer tolerate the old trick of "temporary insanity" to turn murderers loose and resents the release of "cured" cases of incurable disease. Of course, a sane convict will always plead insanity to defer execution, if he has any excuse at all, but he does that anyhow by our present legal routine. There will be no incentive for malingering in other cases, as there is nothing to gain by transfer from prison to hospital for the criminal insane, indeed the prison is pleasanter. Everyone recognizes present defects of our methods of trial, and it is somewhat amazing that the reforms are so long delayed. The first step is to prevent partisan experts from appearing on the stand. Expert witnesses or juries of experts must be employed by the court. The public is becoming restive over the mistrials resulting from "hung juries" where the trouble emanates from the "expert" partisan witnesses.

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The criminal's place in psychiatry was discussed by Dr. Henry M. Friedman, of the Public Health Service in an interesting and instructive article in the *New York Medical Journal* (Nov. 29, 1913). There ought to be more of such articles so that we can check the reaction which set in after Lombroso's theories were found to be baseless. He was quite sure that large numbers of criminals were atavistic and that no amount of youthful training would have prevented their careers. Punishments to his mind could not be corrective and the trend of legislation was in the direction of

permanent restraint of recidivists. When it was found out that youthful crime was largely the result of a vicious environment and that proper treatment restored the great majority to respectable life, a reaction set in, which went so far here and there as to consider all crime as viciousness needing severe punishment. We now know the reason why some boys and girls go wrong in an adverse environment which seems to stimulate others to strive for a better life. Almost invariably the young offender is a mental or physical weakling, defective in one or more directions, but nevertheless as trainable for good as for bad. Friedman makes a plea to place the whole subject in the domain of psychiatry, but we would prefer to call it medical for there are other faults beside the mental. Many are very intelligent, but physically unable to struggle for existence in a daily grind. Most if not all are more or less neurasthenic—some profoundly so—and leave prison in a worse condition than when they entered it. They can work intermittently but must have prolonged periods of idleness. Freedom means starvation, resort to alcohol to deaden the pains, and thefts to supply the funds. It is a horrible life and humanity should prompt us to give them custodial care. That is, the trend of thought should be in the direction of life imprisonment for those who cannot be cured, but not a cruel isolation. We are quite certain that if every case were subjected to expert medical study, ways and means could be devised to protect society from the horde of criminals at large, whose repression can never be entirely successful, and the cost is already burdensome. Criminology should be highly scientific but we have scarcely made a beginning in the right direction.

Though the literature is voluminous, much of it is worthless.

**Emetine as a specific for amebic dysentery and amebic hepatitis** is probably the most important therapeutic discovery in recent decades, excepting of course the use of pus-vaccines in smallpox. Several American physicians have now tried it with success and Rogers, the pioneer in its hypodermic use, reports marvelous results from India. (*British Med. Jour.*, June 22 and Aug. 14, 1912). It is one more instance of a drug used empirically for a long time because savages used it medicinally. It was introduced into Europe by Piso in 1685 and used on Louis XIV by Helvetius. Many physicians in India used it for dysentery during the early 19th century but it was not considered a specific until it was popularized in 1858 by Surgeon E. S. Docker of the Indian Medical Service. Its value was known during our Civil War, and it was strongly advocated then and later by Woodhull and Forwood. Then it sank in popular estimation probably because many failures resulted from using too small a dose or because the drug used had so deteriorated from age as to be useless or because it was used in bacillary cases. Then came the fatal mistake of using a preparation from which the specific had been eliminated (*epicacuahana sine emetina*)—one of the most illogical, stupid and disastrous blunders in the history of medicine. Because this emasculated preparation proved impotent, it was concluded that the straight drug was also useless, and a committee of British druggists tried to throw it out of the Pharmacopoeia. Luckily, that keenest of observers, Sir Patrick Manson, saw the value of the fresh, pure drug and so strongly advocated it that it

was taken up—slowly, gingerly and doubtfully, to be sure, but so successfully that in a few years its use became standardized. There is a rumor that an attempt to popularize the use of ipecac in the Philippine Islands was prevented by a military governor-general, and that hundreds or thousands of men have lost health or life unnecessarily from the consequent delay in making known the value of the drug.

**The discovery of the value of emetine** was the next step in the slow development. It proved to be so powerful an amebicide as to be effective in dilutions of 1 to 100,000 or higher still. Finally, Rogers had the inspiration to use it hypodermically— $\frac{1}{3}$  to  $\frac{1}{2}$  a grain of the hydrochloride or hydrobromide, preferably the former as it is more soluble. One-third of a grain represents 30 grains of the crude drug and as 100 grains or more daily of the latter is often found necessary, the emetine may have to be pushed similarly. It has no bad results, the amebae disappear in a few days, or hours perhaps, bleeding is checked, the stools become normal and cases apparently moribund are soon on their feet. It seems to be as truly a specific for amebae as that other South American plant, cinchona, is for the plasmodium of malaria. The lesson to take to heart is that the effects of these two plants and also of coca leaves have been known to South American savages for hundreds and perhaps thousands of years. It is not at all unlikely that many another drug similarly taken up empirically and now considered inert may have active principles which are specifics for other protozoal enemies and harmless to man. This is an enormous field in which the tares have almost choked the corn, but by cultivation it will yield invaluable therapeutic harvests.

**The study of discarded savage remedies** is imperative, as we have frequently remarked. We may find a specific for the treponema of syphilis and the other spirochetes and trypanosomes. Perhaps sleeping sickness may yield to such research. This is not a bit more bizarre than it would have been a year ago to have asserted that a chemical would soon be found, a grain or two of which hypodermically, would cure an amebic abscess of the liver. We cannot afford to ignore all the drugs which have come down to us from prehistory. Primitive man had not yet invented letters at the time he was making tremendous advances in agriculture and metallurgy. He had no use for writing as he could transmit all his knowledge orally, so we have no record of the steps by which he produced iron and created the wonderful breeds of domestic animals and plants whose very ancestors are not surely known. Consequently we have no idea of how he found out so much about medicinal plants, but he was an exceedingly intelligent observer and could reason from effect to cause, though of course he made many blunders by thinking every sequence a result of some preceding phenomenon. People do that yet. He must also have been a persistent experimenter as the mere survival of the most successful or the fittest of hit or miss efforts cannot fully account for the multitude of discoveries. It is quite reasonable then to believe that medieval remedies were often based on keen observation, though it is a matter of common knowledge that most of them were founded on filthy superstitions. If only one of these discarded remedies prove to be as valuable as emetine, it will repay search for it. Emetine is not a bacillicide, and it is useless in bacillary dysentery. It has been

suggested for typhoid, but we do not know the results, and though it is likely to fail, predictions are dangerous these days. It is said to be useful in hemoptysis.

**Fee splitting** has been so roundly condemned on account of certain associated evils that we have lost sight of the fact that not only are there two sides to the question but the exigencies of practice may fully justify the adoption sooner or later of some form or phase of the custom. The most ethical and progressive surgical practice in the United States, and perhaps in the world, is financed on the system of splitting the fees with the physician members of the firm. Other surgeons should not fly in the face of progress. The payment of salaries to assistants is only another form of fee splitting. The time has long gone by when the physician was sufficient unto himself. Medicine is now so great that the biggest brain can absorb only a small portion. There is a constant effort to make diagnostic tests so simple that the family physician can apply them, but in spite of all this, he requires the aid of other specialists so often that he drifts into relations with a group of them. Experience is showing that it is more efficient and more economical to make those relations permanent. That is, we are moving the way of all evolution, and team-work of a group of specialized units is replacing the free-lance. This is the way multicellular organisms were evolved. In the not far distant future every physician will belong to a firm which splits the fees among the members.

**The evils of fee splitting** cannot be condemned too severely. It is certainly lowering the art to the lowest level of commercialism when surgeons actually bid against each other for cases which are

auctioned off by the physician to the one who will pay the most. The patient is deceived into the belief that the operation is unduly expensive, and that the physician receives only a small fee. The family doctor belittles his own importance, thereby weakening his position and cheapening his services.

If a physician does not value his own advice no one else will. Indeed the brain-work and diagnostic acumen leading up to an operation is often of far greater value to the patient than the mere mechanical work later. Patients often, if not generally, recognize this fact. When they are asked as to the disposition of a fee which covers all expenses, they invariably seem to feel that the medical services are valuable enough to warrant a good share of the honorarium. That is, fee splitting is approved by the sick. It is accepted as a matter of course that the members of a firm or company of doctors shall divide up the fee according to the business principles of other industries—the biggest shares to the ones who do the most for the firm's business. This is not commercialism, but only an equitable way of paying for personal service. Surgeons who will not be content with a fair proportion will drop out of practice. There is already a strong movement among physicians to ally themselves and co-operate with those who will do such team work, the hot-heads even going so far as to advocate a boycott of those surgeons who demand for themselves "all the traffic will bear," and show no regard for the just claims and interests of the family physician. We are not sorry this controversy has developed, for it will help to end the secret splitting of fees, which is getting money under false pretenses. Unless some open above-board scheme of co-operation is

devised to take the place of secret, and for this reason reprehensible, partnership, we are quite sure that many a surgeon will find himself in a position little better than that of a hired man, paid to do certain mechanical work, the physician in charge of the case remaining at the helm and assuming all financial relations with the patient. This plan will at least enable the family physician to retain his patients instead of losing them—too often permanently—as has usually been the case when surgical treatment has become necessary. We feel that the whole question is one of the most important that confronts the medical profession. It cannot be too freely discussed, for only by open, candid discussion can a solution be reached that will be honorable, fair to every interest, and practical.

**Freud's theories of the neuroses** which seem to have taken the psychiatrists by storm, have been summarized by one of his disciples, Dr. Eduard Hitschmann of Vienna, and an English translation by Dr. C. R. Payne of Westport, N. Y., has been published by *The Journal of Nervous and Mental Diseases*. The difficulty of translating new technical terms has contributed to making this work so obscure as to be almost impossible of understanding, and there is no question that such books are utterly unfit for medical students as a class. Freud divides the neuroses into (a) the true neuroses which include neurasthenia and anxiety neurosis, and (b) the psycho-neuroses which include hysteria and the obsessional neuroses. The basis of all his analytical methods is the theory that unwelcome ideas, instincts or impulses are repressed into the unconscious ego and remain there harmlessly and unknown to us. In the neurotic they are transformed or

translated into more or less bizarre and tangled symptoms which can be unravelled by care and persistence. The sexual system dominates humanity far more than we have hitherto suspected, so much so indeed that the reader becomes almost ashamed of himself. Freud's critics strenuously deny that repressed sexual sensations or thoughts are the causes of all neuroses. We, who are less skilled in psychology, would be inclined to think that he has at least exaggerated a bit and that neurotic and erotic are not yet synonyms. Still we are animals after all is said, and though the possession of a big brain gives us power to suppress natural erotic thoughts into the subconscious, they come to the surface in sleep in masked forms. The interpretation of such dreams seems to be Freud's greatest contribution to psychiatry, and there is no question that he succeeds in finding the causes of some neuroses in this way. A less resourceful man would fail and it is safe to predict that the failures will prevent his system from becoming popular. At present it is certainly attracting as much attention as the crude suggestion which masqueraded as psychotherapy in the churches a few years ago, but which was so promptly eclipsed by later sensationalisms. Freud's strong approval of sexual intercourse as a preventive or cure for certain cases will certainly raise a storm of protest as it practically approves of prostitution as a remedy for men and abandons moral women to their fate. The medical profession has hitherto taken strong ground that continence is always harmless, but now Freud states that our physique is built for early intercourse as in savage life and that the delay of marriage in civilization is the real cause of much if not all the neuroses. We have not yet become physically adjusted to

civilization by the process of survival of the fittest and slaughter of the unfit. In other words we are intelligent brutes.

**A mania for the sexual instruction of babies** seems to have taken possession of our professional pedagogs, much to the disgust of not a few of us. There is no question that such teaching is necessary in high schools and that it has proved its necessity, but there are justifiable doubts as to whether we are right in attempting such enlightenment before the brain has grown sufficiently to analyze and classify the facts. Freud has shown that there is an ill-defined sexual life even in early infancy—there must be, as the apparatus and nerve mechanisms are already formed. But all these infantile and childish sensations are not recognized as sexual, and it is a question whether it is wise to hasten the time when their true meaning is appreciated. It is strange that the work is being turned over to unmarried females who cannot know the meaning of many of the things they hear. Indeed an arrested development is not infrequently the cause of celibacy and such anesthetic people never can have the faintest conception of what the normal sexual life really is. They are sure to state things which are apparently harmless but whose true significance is instantly appreciated by children of precocious or even normal sexuality. There is danger then of the instruction sinking into an eroticism of which the sexually immature and unsatisfied teacher is utterly unaware. Attempts to write a letter of sexual advice to girls which meets the approval of their mothers have signally failed. We are afraid failure is inevitable in the new craze. Mothers had better take it up, not old maids—that is, if Freud is right. We are sorry to see the churches leaning towards this

new fad. The clergy are liable to find that instead of being an instrument to lessen immorality, it is quite likely to make vice more familiar—and familiarity breeds contempt not fear. Religion and sex are intimately joined in all savage and barbarous religions, but should be separated in the higher.

**No more study after school hours** is the news from Chicago, and it is a happy beginning of a happy New Year. If this is to be the result of placing a woman in charge of that city's education, why in the name of common sense do we not have women as superintendents everywhere? At the same time, we must confess that the worst offenders in overtaxing little tots with "home work" are the women teachers in the lower grades. We have been calling attention so often and so long to the harm done by home work that we were beginning to despair of reforming the pedagogues. Now that the breezy West has again taken the lead of the effete East, it is time to refer to the subject again, in another effort to end the really frightful system in vogue. Towards the end of a day, the normal child is in a condition of physiological exhaustion. If we could examine its brain cells microscopically we would find them so changed as to be unable to take up the strains. It is a well known fact that in such a condition any effort to learn is either impossible or accomplished at an undue expense of energy resulting in pathological exhaustion which sleep does not relieve. The child becomes neurasthenic in time, unless it neglects its work and is called a bad scholar.

**The early evening is story-time** for the very reason that children are then so tired that a restful position and a fairy tale, are

about as near to Heavenly bliss as anyone will ever reach in this world. How unspeakably cruel and unwomanly to deprive the tots of this necessary pleasure! If more teachers were mothers they would not be so ignorant of the needs of these mere babies. It can also be stated as an axiom that the immature brain can not be trained or stuffed more than three or four hours a day. Mrs. Young of Chicago who is instituting the new system says that "when a pupil leaves school for the day his work will be completed, just as when a man leaves his shop or his office his work is done." She deserves a niche in the Temple of Fame. She will save the health of millions of little ones now ground down to the verge of exhaustion or below it. May Heaven bless her, and may we soon see the day when children never carry home school books. After 12 or 13 years of age, the matter is different and in the high school, home work is essential. If our school boards will not reform, we can easily elect new ones with more sense. Moreover, teachers must realize that it is proof of incompetence to fritter away the school hours and then expect the parents to do the teaching. There will soon be an irresistible popular demand for the dismissal of teachers who thus neglect their duty. We agree with Dr. Chas. L. Dana that the older boys are not pushed enough, but the pushing should not be begun at ten as he suggests. The Germans are now realizing that their intensive system so greatly admired in America, is injuring the younger children.

**Psychology and medical education** have been investigated by a committee of the American Psychological Association (*Science*, Oct. 17, 1913). They conclude that the preponderating opinion of medical

teachers is that some instruction is necessary for the undergraduate or he will not be able to understand the mental side of his patients. They think these lectures should follow the physiology of the nervous system, in preference to work in the premedical years. A second course is advised at the beginning of the clinical studies in psychiatry and neurology, dealing mostly with abnormalities. They also think that both courses should be largely by laboratory and experimental work. There is no question that physicians as a class might know more of mental processes than they do, but it is exceedingly doubtful whether the human brain is big enough for it to absorb and retain *all* the knowledge which would help us in our daily work. The committee, though specialists in the brain and its workings, do not seem to have sufficiently considered its limitations. That is, we are compelled to specialize and, to more or less extent, neglect what is outside our field. This makes us magnify the importance of our own specialty—a fault which is only overcome by the growing tendency to work in teams. Nevertheless it must be conceded that this committee has more in its favor than the usual run of specialists who are constantly trying to lengthen the college course so as to give themselves more hours with the students. It is pointed out that insanity afflicts one in three hundred of the population, and that the non-insane, mental and nervous disorders and the cases of real insanity not needing custodial care, greatly increase the proportion of such patients. Then again, illness always disturbs nervous or mental balance so that there is a psychic element to consider in every case. The successful physician learns by experience how to make allowance for the ordinary nervous and mental abnormalities of patients and no

amount of didactic instruction can give him this power.

The **overcrowded curriculum** seems to be the basic objection to conceding the wishes of the psychologists. There is of course the usual objection to the new, one professor of neurology declaring the newer psychology a fad which in a few years will be as completely forgotten as electricity now is in the treatment of nervous disorders. Some teachers are doubtful as to the need of such instruction, but the vast majority see its usefulness. Reading between the lines is the ever present dread of lengthening the medical course so greatly that it will be impossible to go through it. Even now, many important things are neglected. Peter Daniel of London has called attention to the fact that none of the English graduates entering his hospital services, had the slightest idea of the importance of oral sepsis and some did not even know what Rigg's disease was. These minor things are now known to be the causes of chronic illness and death and yet the graduates were highly trained physicians. There is so much to learn that we are all beginning to be appalled at the task and instinctively relying on one another—what one of us lacks, his partner can supply. We seem to be drifting to the point of limiting the medical course to the fundamentals of every branch—including psychology—and relegating special knowledge to post-graduate study. At any rate, the vast majority of present day doctors need psychological enlightenment and we would suggest to the committee that they recommend two or three small books for this purpose, and if there are none, that they write some. One teacher is quoted as considering much of present literature very mislead-

ing and erroneous, so it might be just as well to go slow about introducing the study into the curriculum for undergraduates, except its fundamental principles. There is no time for laboratory and experimental psychology for men being trained for general practice.

**Miner's phthisis and pulmonary tuberculosis** have been investigated and reported upon by a commission appointed by the Government of the Union of South Africa, and the report recently made public is possibly the most important contribution yet made to this dust-caused disease variously named silicosis, pulmonary fibrosis, chronic interstitial pneumonia, stone-mason's phthisis, potter's rot, grinder's rot and similar terms. It always has affected all classes of men employed in mines, but the worst sufferers have been those who have worked in the most dust, and since the introduction of machine drills the conditions have become truly appalling. The sufferers who have never done machine drilling show signs of it after four years underground and are not in the advanced stage until nine years later, but the cases among machine drillers are affected in two and a half years underground and are in the advanced stages in seven years more. Those who have not done machine drilling until going to Africa, progress more rapidly still. Fully a third of the machine workers show demonstrable signs of early fibrosis and seventy per cent. show signs of definite or serious incapacitation. Naturally the longer they have been at the work, the higher is the percentage affected, the disease existing in 79 per cent. of those who have been underground nine to ten years. The drillers affected average eight years in the mines, the others sixteen. The pathol-

ogy is essentially that of chronic inflammation due to dust particles with the formation of fibrous tissue which obliterates the air cells. Tuberculosis is almost always grafted on in time, and the cause of death is generally tubercular toxemia, but non-tubercular cases sometimes die suddenly of what might be called suffocation from destruction of lung tissue. The commission is positive that the disease is primarily a fibrosis due to mechanical irritation and not intrinsically an infection or a special form of tuberculosis. This is where there is room for discussion. Though only ten per cent. of early cases are proved to have tuberculosis, this is the rule in incipient cases not connected with dust, and, as we have previously mentioned, Jordan of London has shown that fully 40 per cent. of all cases of pulmonary tuberculosis start as a spreading fibrosis from infected peri-bronchial glands at the root of the lung. As a result of further investigations (*British Medical Journal*, Aug. 31, 1912), Jordan raises his estimate very considerably and is now inclined to the view that all cases of pulmonary phthisis begin at the hilus and spread along the bronchi. The lesion reaches the apex later but is noticed there first as it is nearer the surface. It is safe to say that no case of early tuberculosis is discoverable without an X-ray examination which has not yet been extensively used in the investigation of miner's phthisis. In the earliest stages even the X-ray will fail. The infected areas may be very small even after both lungs are extensively sclerotic and the commission itself mentions eight post-mortems made by Dr. W. Watkins-Pitchford, the Government Pathologist, on men who had had tubercle bacilli in the sputum before death, but whose lungs had no naked eye appearances

of tuberculosis and microscopic examinations of sections of the lung were also negative.

**Pulmonary fibrosis may be tubercular from the beginning,** the extensive formation of scar tissue being merely nature's way of heading off the spread of the bacilli in a person possessed of great resistance, who would recover were it not for the injury done by hard flinty particles in the inhaled dust. Coal miners are rarely affected by any form of pulmonary tuberculosis, probably because the particles of carbon inhaled are smoother in outline, less flinty and consequently unirritating. If this is true, cities with clean streets but afflicted by smoke should have less tuberculosis, than those with clear skies but cursed with dusty streets—another reason for supporting the crusade for city cleanliness. At any rate, Hoffman has shown the great prevalence of tuberculosis in all dusty occupations, and we can not go wrong in making our streets free of dust. The commission finds that miner's phthisis may progress to a considerable degree without signs or symptoms and Jordan says the same of peri-bronchial phthisis. So we have no doubt that many a man whose work compels him to inhale much dust in cities which do not keep the streets clean, and who considers himself perfectly healthy is really quite far advanced in pulmonary fibrosis from the spread of infection from tubercular bronchial glands. We all have such foci, perhaps, and they never bother us if we breathe clean air. The commission hopes to reduce their cases by keeping down the dust with moisture but we must accomplish the same end by preventing as much dust as we can and by promptly removing the unavoidable collections. Clean streets should form a large part of the anti-

tuberculosis crusade. Above all else let us stop haggling over the expense of street sprinkling. Overdoing it to the point of making muddy streets is far better than underdoing it. But if we clean the streets properly there will not be any mud. We are glad, by-the-way, to learn that street washing is becoming quite popular the world over, but it cannot replace a preliminary cleaning here because we must not flush any removable dirt into the harbor. As we now have the proof that dirty streets cause tuberculosis, we must have clean ones and we propose to harp on it. The per capita cost is really very little, though the aggregate may look appalling, and each householder can reduce the cost by ceasing to make dirt. Prevention is better than cure anyhow. It would be a good plan to multiply refuse receptacles at street crossings and heavily punish any one detected throwing refuse into the street instead of into the receptacles.

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**Overestimating Mendelian heredity in insanity** was to be expected, as we generally overestimate everything from monomania to brainstorms. It might be well therefore to put a brake on the wagon of progress, now and then, particularly when it seems to be running down hill dragging its facts in the dust. If there is anything anywhere near settled, though of course theories account only for facts so far known, it is that abnormalities are generally modification due to accident and are not transmissible to offspring. A man born pock-marked has normal children and so does one who has had his foreskin cut off, and as a rule so does a man who is injured by any disease, providing, of course—though it is a big proviso, to be sure—his germ cells have not been injured by the toxines of the infection or nutritive dis-

turbance. Ever since Morel wrote about degeneration and its alleged increase from generation to generation—long before Darwin and Mendel had published their facts, by-the-way—we have been obsessed by the idea that a degenerate is almost in honor bound to have children more degenerate than himself. As a matter of fact, the philanthropic world has been furnishing innumerable instances of children of degenerates who grow up normally when removed from an injurious environment, and become the ancestors of normal lines.

**The real amount of heredity in insanity** will be discovered in time and we welcome every bit of evidence. That is why we should be especially pleased with a study made by Cannon and Rosanoff of King's Park State Hospital, reported to the New York Neurological Society, Oct. 4, 1910, (*Synopsis of Science*, Apr. 7, 1911). They have apparently shown that neuropathy is a "recessive" character which is a permanency reappearing in successive generations strictly according to Mendel's laws. That is, if both parents are neuropathic, all the children are also, but if only one parent is affected all the children will be apparently normal but capable of transmitting the hidden or recessive neuropathy. If the latter marry with similar "recessives," one-fourth of the children will be strictly normal, one-fourth neuropathic and the other half recessives capable of transmitting the taint, and so on through the other combinations of normal, recessive and neuropathic parents. These are sad facts and one almost wishes they will be shown to be erroneous interpretations, for it looks as though the original injurious factor which caused the first departure from the normal had made a permanent change in the germ

plasm, and that our much vaunted regeneration of family lines is nothing more than nature's way of killing the worst and letting the normal live. It is a fact, of course, that in such mixed families the average life of the abnormal members is very short—indeed many of the babies born are not viable, and this may, after all, be the way a neurotic taint is sloughed out, and a perfectly healthy stock result in spite of one very bad ancestor. We therefore hope that Mendelian inheritance of neuropathy is overestimated and that an abnormality due to an adversity is not such a permanency as Morel taught us over a half century ago. Surely some neuropathies can not affect the germ cells, and we would welcome some straws of information to grasp even if we must sink in this new sea of facts.

**Changes in family type** are far more common than we have been aware, and they certainly tend to prove that neuropathy can be quickly eliminated through nature's ruthless slaughter of the unfittest for survival, often good types of citizens too, both morally and intellectually—Creole families of pure French blood have scarcely a blond member in our south, though there were plenty in the remote ancestry. We never notice what is going on slowly, and that is why we fail to see the similar process in New England. It has been shown that six old men could have spanned the period from Chaucer to the time the English language was almost revolutionized and yet no old man in those times realized that there was any change of language in his time and generation. We must expect then that changes in human type are similarly unnoticed. So it may be a sad truth after all, that neuropathy is

slowly eliminated in the same way—that is, a greater morbidity and shorter life of the most neurotic of such mixed stock. Regeneration may take on an entirely new meaning—not restoration but elimination. These new investigations will be epoch-making, if they are confirmed. The old case books of family physicians should clear it up, for they have invaluable data in profusion.

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**The causes of high blood pressure** may be quite numerous if it is a result and not a cause of pathological processes. Since our attention has been directed to it by clinicians, we are finding it so often as to create a suspicion that it is sometimes a benefit to have a high pressure,—160 to 180 or so,—and that the cause is some kind of temporary self-poisoning which is contracting the arterioles and thus increasing arterial friction for which the heart instantly adjusts itself. We surely do find a history of some digestive abnormality in the vast majority of cases. Whether or not these temporary high pressures, if frequent or of long duration, can cause arteriosclerosis, is yet to be proved, as we have not studied the condition long enough to find out. Perhaps it may cause such hardening in the defective, but as far as we know, we are justified in telling a patient not to worry unduly over it, but to find out what articles of his diet fail of proper digestion. Here is where a scientific dietician may do a world of good, for clinicians are quite unanimously of the opinion that the offending article is one or more of the numerous proteins we consume, but theory and practice are purely empiric at present. We know that any one species of animal is quite restricted in

its choice of proteins. It cannot produce the required enzymes for proteins which are easily assimilated by some other species. There are doubtless individual differences, so that it may be scientifically correct to say that what is one man's meat is another's poison. This is about as far as we have gone, and we must now wait for the chemists to learn a little more about the proteins of our habitual and occasional foods. We are safe in predicting great usefulness for scientific dietetics, and urge the cultivation of this field. The puzzles of blood pressure must be cleared up, so that we can distinguish the harmless or temporary cases from those due to irreducible organic changes. In the meantime, it might be wise to abate some of our strenuous measures to reduce blood pressure, until we find out what it means, and whether it is needed. It is in danger of becoming a fashionable fad instead of a signal of distress.

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**The sleep cure** is the inevitable result of the swing of the pendulum from our athletic excesses of the last two decades. It is now heralded in by head lines that a certain European physician is advising a thirty-six hour sleep once a week—goodness knows what for unless for the fat fees from wealthy over-worked Americans. It is even suggested for ladies who have been getting too thin with over-much riding, tennis and what not. Perhaps the pendulum is on its way back and we are destined to see a new fashion of the "sleepy life" to repair the damages of the strenuous one now on its way to extinction. At any rate, we can make use of the new craze to kill the old ones, and do our utmost to prevent it becoming pernicious in turn.

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## MEN AND THINGS



**Brigadier General George Henry Torney, U. S. Army.**—General Torney died in Washington, D. C., Dec. 27, 1913, of pneumonia. He had been



ailing for some weeks but no alarm was occasioned by his condition until a few days before death. He was born in Baltimore, June 1, 1850. He received his degree at the University of Virginia in 1870 and entered the Navy as assistant surgeon the following year. He resigned in 1875 to enter the army as assistant surgeon. He was promoted major in 1895, lieutenant colonel 1903, colonel in 1908, brigadier general and surgeon general in 1909. He was chairman of the War Relief Committee of the American Red Cross Society. He had served in both Cuba and the Philippines. He was a member of the American Medical Association, the Association of Military Surgeons, and the District of Columbia Medical Society.

**Dr. Hermann M. Biggs, the new State Commissioner of Health of New York,** brings to his new duties a rich



experience as physician, pathologist and sanitarian. He has been connected with the New York City Health Department for over 25 years and has been one of the pioneers in the anti-tuberculosis movement. As he was

chairman of the commission which prepared the new health law of the state, it is quite fitting that he should guide the administration and establishment of the new system. The former commissioner, Dr. Eugene H. Porter, has established a high standard of efficiency and ability in the nine years he has administered

the office. While sorry to lose his services, the public can rest assured that his mantle has fallen on able shoulders. There will be no falling off in the work Dr. Porter has so ably started.

**A special word concerning Dr. Porter's services** would seem to be called for, as he is about to turn over the office of Health Commissioner to his successor. Appointed by Governor Higgins, Dr. Porter's scientific and administrative abilities have been so marked that Governors Hughes, Dix and Sulzer were glad to retain him year after year. When Governor Sulzer

came into office we seized the occasion to point out the splendid work Dr. Porter had been doing and the benefits that had accrued to the State. Dr. Porter has been not only a faithful public servant, but a very able one. His tenure of office extending over the administration of four governors, has been marked by notable progress and accomplishment. Without the slightest exaggeration it can be stated that under Dr. Porter's direction the health department of the Empire State has attained a degree of efficiency that has been equalled by few other states in the Union and surpassed by none. As Dr. Porter passes out of office once again is emphasized the grave fault of our official system in the United States that many European countries have had the wisdom to avoid. In these foreign states and cities the training, experience and efficiency of certain officials, such as health officers, are considered public assets. The longer an official, who is efficient, holds office, the more useful he is considered. Under no consideration would the people countenance dis-

missal of a good and capable official who has become thoroughly trained in the duties of his office, and tolerate his being supplanted by perhaps a totally untrained man, for no other reason than to honor some prominent citizen, give some one else "his turn in the office," or discharge a political obligation. Such a course would be looked on by the people as a flagrant betrayal of their interests—and they would be pretty nearly right. The desire of the founders of our national, state and municipal governments to avoid the development of classes was responsible undoubtedly for our system of rotation in office. Possibly there is much to commend in such methods. But there is a great deal to be said on the other side when we come to consider officials whose value in the public service depends on special aptitude, long training and the acquisition of special experience. Since this training and experience are obtained usually at public expense, this fact alone, to say nothing of the practical advantages, would make the retention of such officials simply thrifty common sense. All of which brings us to the conclusion that if the State lets Dr. Porter retire to private life and fails to make some arrangement whereby his knowledge, training and experience can be utilized for the public welfare, it will be a sad reflection on the judgment as well as genuine interest in the health of the people of those at the helm. There are not so many men with the information gained from eight years' successful administration of the health department of a State like New York, that we can afford to lose their services, even if we retain them in only an advisory capacity.

**Silas Weir Mitchell.** Death has removed another great American physician, and one who was also a great novelist and more than an ordinary scientist, poet and historian. Indeed, S. Weir Mitchell stands alone in the history of the world in the possession of a combination of great talents which are generally considered incompatible—so rarely are they found together even in minor degree. A physician who writes novels is likely to lose caste as a doctor, for it is a popular idea that he cannot be great in both callings; but Mitchell was consid-

ered so great a physician that he could not lose his reputation. His novels were probably a bit overrated because he was a great man, in the same way that Disraeli was a bit overrated as a statesman because he was a great novelist. Mitchell's vocation was neurology and his avocation literature, but Disraeli's vocation was literature and his avocation politics. Each man was greatest in his own vocation and thereby lighted up his other work, and though their respective avocations alone would have made them great they would not have ranked with the best.

Both these men were instances of genius appearing in families already noted for ability—a fact which has been frequently mentioned by genealogists—indeed it is the rule, and the lone genius in a family of dolts is the rare exception or is an instance of pathologic one-sided development. Mitchell's father was J. K. Mitchell, a great physician and a poet, so that the son had the ideal environment for developing his talents. He was recognized as a brilliant writer in his youth, but his first novel did not appear until he was 53. This is often incorrectly mentioned as an instance of men taking up new callings successfully after middle life. The story is told that he wrote it to escape the ennui of his long summer vacations when he had attained such an income from his medical practice that he could afford to go away for "rest." It is probable that this complete change of work was more restful and recuperative than idleness—a lesson we might all take to heart. We would all be better doctors if we could drop doctoring two or three months a year and work like beavers at something entirely different.

Mitchell is another instance of overcoming ill health in youth and reaching old age. He had to give up his studies for a whole year and many another great man has had the same experience. Moreover, Mitchell, like Darwin, was on the borderland of invalidism all his long life, and now and then was very sick. There is a growing medical opinion that such a condition, like neurasthenia, actually prolongs life, because it compels the sufferers to forego that active muscular work which strains the heart and arteries and brings on old age and death prematurely. Clergymen and other sedentary men who can get outdoors every day for some hours have the longest lives, and

we must revise our opinions of the effect of strenuous sports. Active exercise may not be as necessary as we think, and might be injurious.

The mediocre doctor is devoid of imagination, and this may be good, for it prevents him running after false therapeutic gods. He forms the bulwark of conservatism. The leaders are great because blessed with an imagination which is close kin to poetic inspiration. They can see the true gods where the less gifted are blind. It is not remarkable that a few are distinguished as poets and novelists, but it is astonishing that all do not contribute to lay literature.

Mitchell was born in Philadelphia in 1829, and served in the Civil War three years. His ambition to be a mere teacher of what others had done was luckily denied fulfilment, as it gave him more time to create. In every year since his thirtieth he has added to the world's stock of knowledge, for even his novels are instructive. And this very work kept his brain active for further labor, and he produced to the end. He is entitled to the greatest epitaph that can be engraved on any man's monument.—*He died in the Harness.*

#### **The appointment of Dr. S. S. Goldwater as Commissioner of Health of the City of New York, is another happy selection.**



He is already noted as a physician and hospital administrator, and it is the first instance for a long time that a trained executive has been selected for this important position. His hospital experience is exactly what the city needs, now that there is such a demand for new constructions and a rearrangement of existing facilities in the control of the Health Department. Indeed there are not a few who think that all the agencies for the direct prevention and cure of disease should be under one executive head. We extend our congratulations to Dr. Goldwater upon his enormous opportunities for enhancing public welfare. He was the pioneer to introduce apparatus for cooling hospital wards in summer, as often suggested in these columns to save the lives

formerly sacrificed in every hot wave, and we may expect him to be equally progressive in other matters.

**Sewage contaminated oysters** have so often been found guilty of causing typhoid fever that it comes as a shock to learn that Dr. Charles V. Chapin, Superintendent of Health, Providence, R. I., says:—"many oysters from polluted waters have in past years been consumed in Providence, but I have been unable to determine after a careful consideration of the data that this has had any influence on the incidence of typhoid fever in this city" (*Am. Jour. Pub. Health*, Dec. 1913). Still he thinks that sewage discharged over oyster beds can be disinfected and should be as Providence does with its 20,000,000 gallons daily! Here is another case where we must not trust too implicitly in Providence—Rhode Island—for some other man might trace typhoid to oysters if Dr. Chapin cannot. We have often commended Dr. Chapin's courageous stand on certain sanitary problems and he has done a real service in pointing out to the world the fact that diphtheria and such diseases are usually carried directly from one person to another. Thus he has shown one clearly defined way of avoiding many bacterial infections. Since we have learned how certain diseases are carried by insects we have been able to develop still other lines of prevention and defense. In spite of the foregoing, however, it has not been proved that some infections are not transmitted indirectly. Typhoid is probably always carried in this way. Consequently disinfection—effective disinfection—must not be neglected but used rationally with all other ways and means of combating infection.

**What to do with oysters from sewage polluted waters is a problem** that deserves our most careful thought. Some effective method of disinfection would seem to be called for, but if Dr. Chapin is correct in his assertion that the Providence cases of typhoid have never been due to oysters, it is an illogical waste of public funds to insist on disinfecting the sewage. Until, however, we have some very positive proof that there is no harm in polluted oysters we must advise visitors not to eat raw ones in Providence—nor anywhere

else if sewage contamination is even suspected. The bulk of evidence to date warrants the conclusion that contaminated beds, moreover, should be discontinued by law.

Rhode Islanders may be able to eat polluted oysters with impunity. Certainly, if Dr. Chapin's statement is correct, they have acquired an immunity that effectually protects them against their own Providence River product. But how about visitors to the hospitable shores of Narragansett Bay? They may not find these luscious, sewage-fatted oysters as harmless as the local residents who have been eating them, as Dr. Chapin intimates, for years. It may come that Rhode Islanders can only retain their proverbial reputation for hospitality by serving anti-typhoid vaccine regularly with their oysters. Possibly some local physician may win undying culinary, as well as medical fame by developing an anti-typhoid oyster cocktail sauce or dressing that can be guaranteed to remove all danger of infection. The famous Rhode Island shore dinner may yet be forced to include as an attraction—or safeguard—a regulation dose of anti-typhoid vaccine. The acme of the situation will be reached when the Providence department stores advertise "Double doses of anti-typhoid vaccine given free on Fridays with every quart of oysters!" or "Free to-day, a full size bottle of Carbolized Anti-typhoid Catsup with every dozen of our fresh sewer-fed oysters."

**The Passing of a Great Bacteriologist.**  
—The death of Edwin Klebs, at Dortmund, Oct. 21, 1913, in his eightieth year, ends a very remarkable career, part of which was spent in America, as professor of Pathology in Rush Medical School in Chicago, where he remained some time after 1895. Though his name is connected with only one great discovery—that of the bacillus of diphtheria—it is a sad fate that he is given no credit for at least seeing the causes of tuberculosis, typhoid fever and leprosy long before their true roles were announced by Koch, Eberth and Hansen respectively. He seems also to have been the first to think that tuberculous cattle transmitted the disease to man. He made the first moves in the tuberculin method of treatment and the use of bacilli from cold blooded animals.

It seems that the restlessness which kept him constantly changing his place of labor, was partly responsible for shifting him into so many kinds of investigation and also prevented him from following up his great observations until he could force the world to acknowledge the facts. He was limited in usefulness by the very qualities which made him a great investigator. It is a pity he did not work "in a team" with others who while not able to see the things he saw, could have made practical use of them after they were pointed out. Others have reaped the harvest from the fields he prepared and from seed he planted. Like another European who lived with us a while, Thomas Paine, he was ahead of his time. Indeed Paine was persecuted for suggestions which everyone now-a-days accepts as proved, and others have been given full credit for great movements of which Paine was the real originator. Klebs has left a record of tremendous achievement, which should inspire us to observe. Even his failure to follow up his discoveries should inspire us to avoid such faults of omission. He was born in Königsberg in 1834.

#### WATCH YOURSELF GO BY.

Just stand aside and watch yourself go by;  
Think of yourself as "he," instead of "I."  
Note, closely as in other men you note,  
The bag-kneed trousers and the seedy coat.  
Pick flaws; find fault; forget the man is you,  
And strive to make your estimate ring true.  
Confront yourself and look you in the eye  
Just stand aside and watch yourself go by.

Interpret all your motives just as though  
You looked on one whose aims you did not  
know.  
Let undisguised contempt surge through you  
when  
You see you shirk, O commonest of men!  
Despite your cowardice; condemn whate'er  
You note of falseness in you anywhere.  
Defend not one defect that shames your eye  
Just stand aside and watch yourself go by.

And then, with eyes unveiled to what you  
loathe—  
To sins that with sweet charity you'd clothe—  
Back to your self-walled tenement you'll go  
With tolerance for all who dwell below.  
The faults of others then will dwarf and  
shrink,  
Love's chain grow stronger by one mighty  
link—  
When you, with "he" as substitute for "I,"  
Have stood aside and watched yourself go by.  
—S. W. Gillian, in *Success Magazine*.



## TUBERCULOSIS FOLLOWING TYPHOID FEVER.

BY

CHAS. E. WOODRUFF, M. D.,  
New York.

It has been known for a long time that tuberculosis sometimes follows typhoid fever, but the discussions have largely been confined to the cases in which the interval between the two is very short and there has always been some doubt as to the diagnosis. In 1872 Dr. R. T. Edes reported a case of acute tuberculosis simulating typhoid fever (*Boston Medical and Surgical Journal* X. 326) and in 1883 Dr. Geo. H. Lyman reported a similar case under the title, "General Tuberculosis as one of the Sequelae of Typhoid Fever" (*Boston Medical and Surgical Journal* CIX. 607). About the same time Prof. L. Landouzy of Paris described cases of what he called typho-bacillose and which he considered tubercular septicemia in which the symptoms are typhoidal but there is neither diarrhea nor rose-spots. They sometimes recover but generally develop tuberculosis after an interval of a few days, weeks or even years of apparent health. He says that since the Widal and other tests have been perfected these cases have been shown to be free of typhoid and that post-mortems of those dying in the early or typhoidal stage never show any signs of typhoid. (*Transactions 6th International Congress on Tuberculosis*, Washington,

D. C., 1908. Vol. I, Part 2). C. L. Minor in discussing the above paper said he had noticed that a considerable number of his cases had reported a previous typhoid and that undoubtedly most of them did have typhoid though he thought that some were cases of typho-bacillose. It is probably safe to say that the majority of phthisiographers are of opinion that at least some of the cases of alleged typhoid and many malarias in the prior histories of consumptives are nothing more than a run of fever from a temporary activation of the tubercular lesions, though none have discussed the possibility that tuberculosis could modify the typhoid process so profoundly as to prevent the characteristic course, the patient suffering from a real typhoidal septicemia which left no discoverable lesions.

On the other hand, the cases of well authenticated typhoid which later turn up with tuberculosis have been noted a long time. Dr. Jno. S. Billings of the New York City Health Department says in a personal letter that while he was at Johns Hopkins Hospital in the early nineties, and where a most elaborate study of typhoid was made under Osler, they gained an impression that it did predispose to tuberculosis. Doctors Ralph and Roy Matson, the well known specialists of Portland, Oregon, were probably the first to notice that typhoid fever appeared in the prior histories of consumptives with great frequency. It now heads the list of the predisposing

causes in their history blanks. Dr. Louis A. Samson of the London School of Tropical Medicine informs me that when he had charge of the typhoid wards in an Italian Military Hospital, he was particularly struck by the large number who became tubercular a few weeks or months after convalescence from the first infection. Sometimes the interval between the two was so short that the new process was at first considered a relapse of the typhoid. He found that the tubercular process was exceedingly rapid and fatal.

Prof. Maurice Le Tulle of the Paris Faculty of Medicine informs me that he too had long noticed that cured typhoids not infrequently return to the hospital in four or five months with tuberculosis and that sometimes the interval is short or one process ran into the other. Indeed he has found tubercular meningitis to be a cause of death in typhoid fever, showing that the new process may be fatal before the typhoid has run its course. He has had some cases in which the nature of the first fever could not be determined as it gave no signs or symptoms of either typhoid or tuberculosis and neither bacillus could be recovered, and yet the cases died of rapid tuberculosis after the first fever had subsided. In a few cases he has found tuberculosis from the beginning—a rapid galloping infection which is fatal in a few weeks. The reason for this sudden and appalling loss of immunity could never be discovered. There can be little doubt nevertheless that it was due to a new infection which had more effect in hastening an incipient tuberculosis than in causing lesions itself. The less advanced a case of tuberculosis and the greater the resistance, the longer should be the interval between convalescence from typhoid or other infection and the appearance of signs of tuberculosis thus made ac-

tive. Perhaps one with incipient phthisis might be more prone to develop typhoid than the non-tubercular whom we know have considerable if not complete immunity particularly if they live in endemic territory. Le Tulle states that acute tuberculosis may run parallel with true typhoid. Loeper and Esmonet (*La Tribune Medicale*, March, 1912) have reported that acute or chronic enteritis is frequently followed by tuberculosis and that this disastrous sequel can be prevented by a diet liberal in fats and proteins. There was no discussion as to the possibility of some of these cases being typhoid.

The long interval which may elapse between the beginning of tubercular activity and the onset of symptoms generally prevents the discovery of the activating cause. It is not strange therefore that the literature should be so devoid of studies of the relation of typhoid and tuberculosis. Nevertheless there is a decided impression that any serious infection may lead to consumption. The matter has assumed great importance since the recent discoveries that every child is born free of tuberculosis but soon acquires it, and that the lesions become active sooner or later in every one of us. By personal inquiries both here and in Europe, I find that the above facts are accepted as established, and that there is an increasing number of the profession who are also convinced that no one is ever able to rid himself of the infection acquired in childhood, and that every consumptive has something in his history which shows infection since childhood. Le Tulle informs me that he has found living tubercular bacilli around calcareous glands which were apparently entirely healed old lesions, though he believes that we can get entirely well and later receive a new infection.

It is safe to say, then, that all civilized people are tubercular and undergoing constant auto-vaccination which causes an effective immunity. Phthisiographers the world over seem to be coming to the opinion that no one ever is infected in adult life and that if he does develop incipient tuberculosis it is because something has interfered with the manufacture of his antibodies. That is, the new view point is that the infections like measles, whooping cough and typhoid do not render us susceptible to tubercular invasion, but they reduce our resistance to the bacilli which are already intrenched. The earlier we receive any infection, then, the more likely it is to cause the tuberculosis to spread, tubercles being found in the majority of children dying of disease. All this was long ago reported by Laennec, (Elliott. AMERICAN MEDICINE, June, 1913) and there are not a few who now state that not only tuberculous glands but tubercles elsewhere can be found post-mortem in every child over six if we look for them. (Thrash in *N. Y. Med. Rec.*, Jan. 3, 1914), It is now charged that children fed on condensed or sterilized (not Pasteurized) milk develop tuberculosis but those fed on raw milk do not, even if the milk comes from tubercular cows. As we grow older and acquire full immunity, fewer of us become actively tubercular after the other infections. The only ones who become actively tubercular after typhoid, are probably those who have partly lost their immunity from some other causes. Lyman (*ibid*) quotes Liebermeister, who found general tuberculosis four times in 250 autopsies after death by typhoid and who concluded that in these four, active tuberculosis existed at the time of typhoidal infection, and was hastened in its course by the new poison. As

that proportion of young adults in the cities of that period had tuberculosis in the incipient stage, it seems that typhoid will cause general tuberculosis in all whose lesions are active, and that it will activate a certain percentage of quiescent cases which develop symptoms in a time varying with their original resistance. At present active tuberculosis is far less common and there must be fewer cases of tuberculosis following typhoid either directly or remotely. It may be mentioned here that the three diseases which seem to be most frequently followed by tuberculosis of the lungs—measles, whooping cough and typhoid—are all complicated with bronchitis.

When one is losing his immunity to tuberculosis through overwork, worry, lack of nutrition and fresh air, or any of the thousand other causes, there comes a time when his latent lesions are just able to spread. The system is so delicately balanced that a straw will move it one way or the other. Le Tulle tells me that all serums and vaccines will cause incipient cases to get rapidly worse. He has particularly noticed this in giving the antitoxins of diphtheria and tetanus. Even injections of sea-water, once popular in France, will do the same, and he has also found that injections of physiologic salt solution will cause a reaction with fever of 39° in latent tuberculosis and may be used for diagnostic purposes. Dr. C. H. Spooner (*Journal American Medical Association*, October 12, 1912) and Louis and Combe, assistants to Vincent, at the Val de Grace in Paris, have noticed that antityphoid vaccine brings out latent tuberculosis. The latter states that the vaccine acts like tuberculin and that they have been thus able to detect active tuberculosis in cases where the condition was not suspected before the inoculation.

(*Monde Medical*. December 5, 1912) Chantemesse of Paris informs me that he has seen two cases of rapid tuberculosis develop a few days after anti-typhoid vaccination, and he warns particularly against using it where tuberculosis is suspected. None of these observers have mentioned any cases developing after a longer interval. Dr. A. Besredka of the Pasteur Institute writes me that he infected eight guinea pigs in the eye with tubercle bacilli and after a time inoculated four of them with an appropriate dose of dead typhoid bacilli. Three of these inoculated ones died within fifteen days and one was living at the time of writing. Of the four controls, one died and three were still living. This is so important that more tests will be made. It is quite possible that if the animals are given avirulent tubercle bacilli, the course after administration of typhoid vaccine will be different than in the case of large doses of very virulent ones. In this latter case the course may be so rapid that a few typhoid bacilli will have no appreciable effect.

Incipient tuberculosis is a *nolle me tangere*. So delicate is the system, in the long period between the beginning of activity of the latent tubercular foci and the onset of symptoms, that almost any strain hastens the process. Many writers have reported the dreadful rapidity of the process in those who go to the tropics. Sambon states in his works on acclimatization that this activation of latent tuberculosis is due to typhoid, malaria or some other tropical infection. There is ample justification then for suspecting that a fever which attacks a person in apparent health, which clears up in a few weeks, and which is later followed by tuberculosis, is some non-tubercular infection such as ty-

phoid or malaria. A fever which attacks a person in poor health and which runs a typhoidal though atypical course, is probably a mere run of fever of incipient consumption. Even in these cases there must be some cause for the relapse. Tuberculosis does not act that way without a cause, and there are a thousand things which could do this. Among them are the infections, and the unrecognized mild atypical typhoids must be suspected where typhoid is prevalent as in France and parts of this country. It must also be remembered that tuberculosis antibodies as well as tuberculin could so profoundly modify the activity of typhoid bacilli or any others as to prevent the usual symptoms and signs or even abort the process. These cases will probably never be cleared up, but they are too few to alter the general conclusions of this paper. Mild typhoids are generally unrecognized. As far as I have been able to determine, the cases of "typhoidal onset" of tuberculosis, of typho-bacillose and of a run of fever like typhoid after tuberculosis has been recognized, occur largely if not entirely in places where typhoid infection is widespread. Some are probably typhus or paratyphoid.

Consumptives seem to have had more typhoid fever than the rest of the population though there is no way of determining this point accurately. The death rate from typhoid in New York City has averaged about 15 per 100,000 in the life time of the present adult population furnishing most of the consumptives. A death rate of 10 per cent. of recognized cases would give 150 cases per year and 3,000 cases per 100,000 population in the twenty years of typhoidal susceptibility. That is 3 per cent. of adults have had a recognizable typhoid fever sometime in their lives. In the

country at large the rate is higher, probably 5 per cent. From a survey of a few whom I could ask, these percentages seem near the truth. Mr. F. L. Hoffman of the Prudential Life Insurance Co. informs me that of 500 consecutive deaths from tuberculosis last year 18 or 3.6 per cent. had a record of typhoid prior to insurance. Few applicants conceal the fact of having had typhoid as it does not cause rejection. Adding .36 per cent. for deaths and 1 per cent. for those who developed tuberculosis and became uninsurable, it is evident that over 5 per cent. of this element of the population, contract typhoid before the average age at insurance. There are no data as to how many of the 500 had typhoid after insurance.

Dr. Bolduan of the New York City Health Department has transmitted to me some statistics collected by Dr. R. Westmorland of the Riverside Hospital, North Brother Island. Of the 251 tuberculosis patients in the hospital July 23, 1913, fourteen or 5.57 per cent. had a history of typhoid. This seems to be about double the rate of the non-tuberculous New York City population. Unquestionably the typhoid fever was not the activating cause in many of these cases for too many years elapsed before the onset of symptoms of tuberculosis as seen in the following table. Still, typhoids have very far reaching results.

<u>Cases</u>	<u>Years Interval.</u>
1	2
2	7
2	8
1	9
1	10
1	16
1	17
1	24
1	25
1	46
2	47

Dr. Theodore B. Sachs reports that of the 900 patients in the Edward Sanatorium at Maperville, Ills., during the last six years 103 or 11.44 per cent. gave a history of typhoid as follows:

<u>Years before onset</u>	<u>Cases.</u>
Immediately prior ----- (some probably wrongly diagnosed)	11
1/4	1
1	3
1 1/2	2
2	7
3 1/2	3
4	2
5	4
6	4
7	4
8	1
9	5
10	2
10 - 15	19
15 - 20	14
20 - 25	11
25 - 30	10

Of 166 female patients in Otisville Hospital suffering from incipient tuberculosis, 3.6 per cent. had had typhoid fever, and of 287 males, 7 per cent. Males have more typhoid fever than females according to the census. Dr. Fred H. Heise of the Adirondack Cottage Sanitarium, Saranac Lake, N. Y., finds that 14.4 per cent. of 1,000 cases of tuberculosis give a history of typhoid or possible typhoid (typhoid-pneumonia, typhoid-malaria, etc.). Here too the interval between the typhoid fever and the onset of symptoms of tuberculosis shows that the typhoid was not the cause of activation in all, though the typhoid occurring after the onset of tuberculosis unquestionably hastened the course.

In at least half and possibly more typhoid can be suspected of being the cause of the tuberculosis. It seems then that these cases have had almost three times as much typhoid fever as the population at large.

Typhoid Cases	Interval in years after onset of tuberculosis.
1	4
2	3
2	2
3	1
16	Same year
	Years before onset of tuberculosis.
6	1
10	2
12	3
4	4
7	5
12	6
7	7
3	8
7	9
7	10
3	11
6	12
1	13
1	14
3	15
3	17
4	18
4	19
1	20
5	21
1	22
2	23
1	26
1	28
1	30
9	Childhood.

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This percentage seems to be over double the estimated rate of typhoid among the population furnishing these consumptives.

Dr. Frank C. Schrubsall of London, who has made most extensive studies of tuberculosis in that city's hospitals writes that the matter has never been looked into but that a brief study of a few notes did not enable him to find a single case of typhoid. Probably there will be some found in a later search but there will be very few as typhoid is practically absent from London. Dr. J. S. Mackintosh, who has an extensive private practice, informs me that he has seen but two cases in eighteen years. As will be noted later, London also has far fewer cases of tuberculosis than places where typhoid is prevalent. All of its consumption must be due to other causes than typhoid. The Registrar General of England reports that over three per thousand of the population has been notified to his office as suffering with pulmonary tuberculosis. Jordan (*British Medical Journal*, August 31, 1912) finds that all cases of

pulmonary tuberculosis begin in the peri-bronchial glands at the root of the lung and that fully forty per cent. of cases recognizable by X-rays, give no signs or symptoms. Apex involvement is a rather late stage, and fibrosis of the lung may not be discovered until it is in an advanced stage. In many a case, bacilli are not found in the sputum until a short time before death.

In the very beginning of activity, even the X-ray will not reveal the small lesions, and if we add all these unrecognized cases and the other forms of tuberculosis, to those late cases which have been notified to the Registrar's office, it is safe to say that one per cent. of the population of Great Britain is in a condition to develop consumption should they become infected with typhoid fever. In this country fully two per cent. are in this condition and perhaps more.

There are other facts which taken together show a relation between typhoid and tuberculosis, though each by itself is of

little value. For instance, the mortality curve of tuberculosis which rises rapidly from childhood reaches a maximum before thirty and declines after thirty-four, while the maximum of typhoid is reached at fifteen and declines after twenty-five. The curve of tuberculosis seems to follow that of typhoid after an interval of about nine years and the average length of life after tuberculosis becomes evident is said to be seven years. It might mean therefore that the typhoids mostly contracted before twenty-five or thirty have been partly responsible for raising the maximum mortality from tuberculosis nine years later.

The 1911 tuberculosis death rate of the colored population in the registration area was 405.3, while the white was 126.2. This is partly due to the greater prevalence of all diseases among negroes except diabetes, erysipelas, scarlet fever, cirrhosis of the liver and cancer (Census Report). The colored typhoid death rate was 44.9 and the white 19.9, and the malarial death rate was 19.8 for negroes but only 2.3 for white.

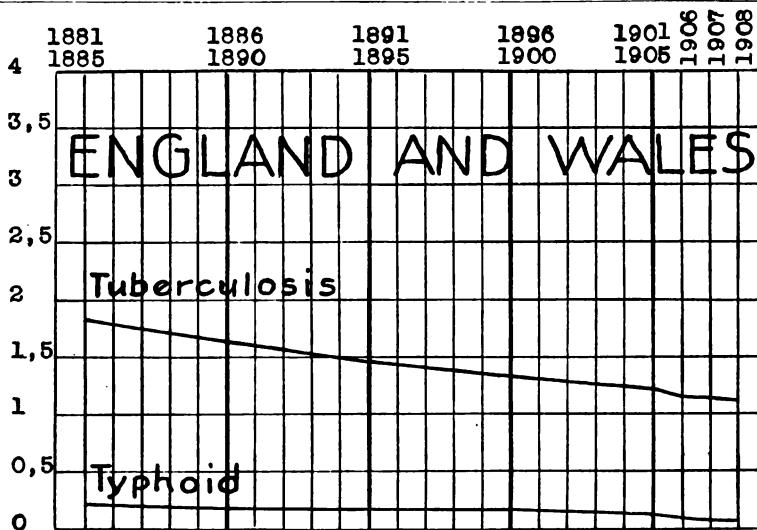
It is significant of the relation of typhoid to tuberculosis that males predominate in the deaths from each cause. In the registration area of the United States in 1907, 61 per cent. of the typhoid deaths were males, and 56 per cent. of the deaths from tuberculosis of the lungs. Females were slightly more numerous in abdominal tuberculosis, but in a decided minority in all other forms. Of course this may mean that males are more susceptible or more exposed to both causes, but it might also mean that typhoid is a predisposing cause which ultimately kills more males from tuberculosis in spite of their outdoor life as compared with women.

Where typhoid fever is prevalent there should be more tuberculosis than in places

free of typhoid, and variations in the typhoid death rate should be followed by similar variations in the tuberculosis death rate at that place. It is also evident that in a place where tuberculosis is quite common, typhoid fever should have more effect in increasing the death rate from consumption than in places having little tuberculosis.

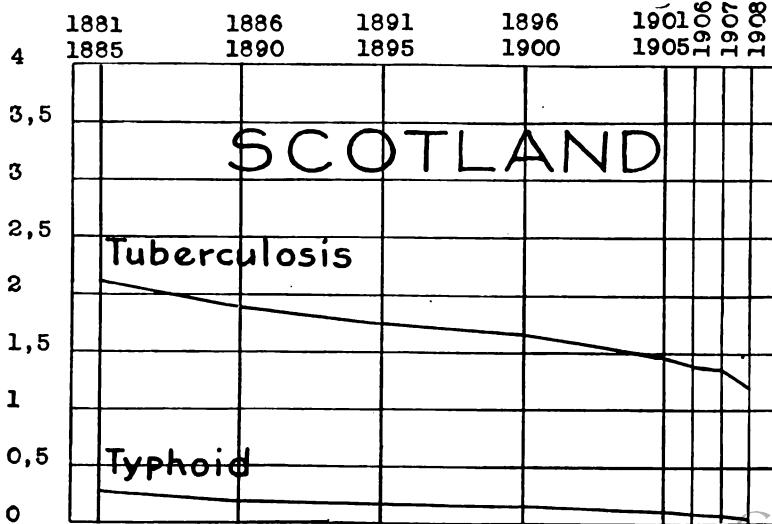
These propositions seem to be proved by the accompanying charts of death rates which I found in the Office International d'Hygiène Publique, in Paris. The director, Mr. Jacques de Cazotte, kindly had them copied for me. It will be noticed that the two curves show more or less parallelism throughout the civilized world. We omitted the curves for the other infections he had plotted—smallpox, diphtheria, scarlet fever and plague as they come in epidemics and present irregularities having no apparent relation to the two endemic diseases typhoid and tuberculosis. We also omitted the charts from countries whose vital statistics are not reliable. Unfortunately neither measles nor whooping cough have been considered of sufficient importance to record, and we have no way of determining how far they are responsible for irregularities in the curves. As these diseases seem to be as common as they ever were, they have not influenced the tuberculosis curve except to keep it up perhaps.

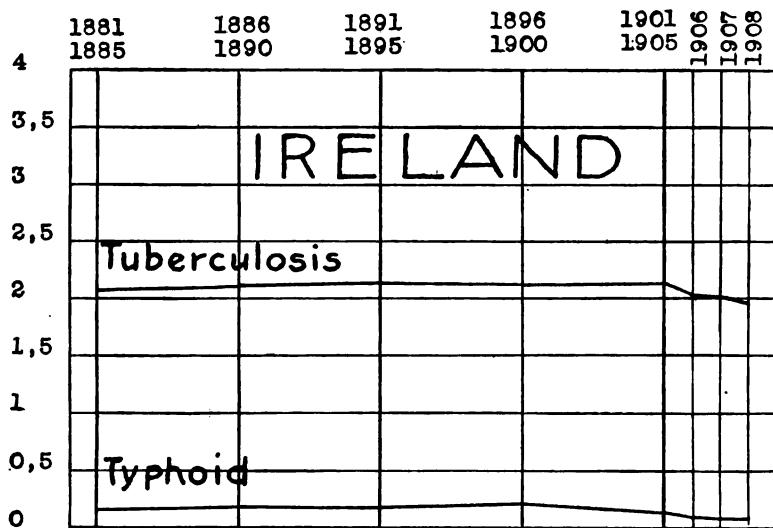
Charts I and II of England and Wales and Scotland need no comment. Ireland (Chart III) shows an increase of tuberculosis while typhoid was increasing and a subsequent drop in each, beginning in the period 1901-5. In the Netherlands (Chart IV) the inclusion of all tuberculosis after 1900 makes two separate curves which follow the rule in a general way. The same



may be said of Belgium after 1902 (Chart V); excepting the single year 1903, which may be an artefact. Australia (Chart VI) shows a parallelism in the long run, but irregularities of the typhoid curve cannot be explained in the absence of information as to whether there were occasional epidemics, or changes in the class of cases called "typhoid." Germany (Chart VII) needs no comment. Austria (Chart VIII) follows the rule, although the collection of statistics in that country has not been regular, complete, nor accurate, and typhus

was included with typhoid until 1905. In Italy (Chart IX) there was a sudden drop in 1887, and in Denmark (Chart X) in 1888 and 1889. These were probably due to the fact that a bacterial diagnosis was required by the profession about that time, and we then excluded cases not having demonstrable bacilli. Before and after the drop, the curves follow the rule. France (Chart XI) follows the rule, both diseases being very prevalent. The figures for 1887-1890 refer to the larger cities only, and they have more typhoid and

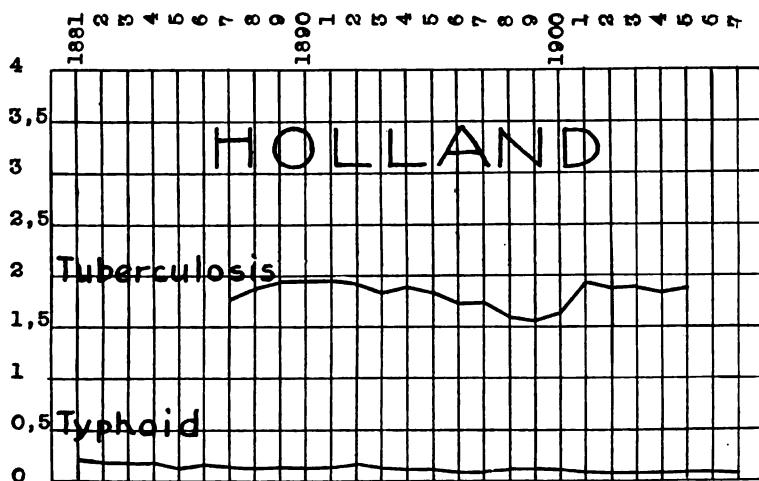


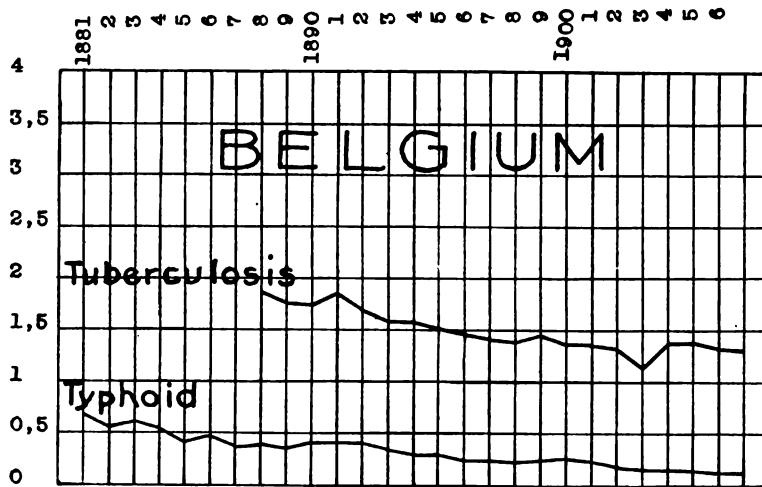


tuberculosis than the smaller ones which thus reduces the curves for all France after 1890. In the United States (Chart XII) the registration area follows the rule, one curve copying the other. Sweden (Chart XIII) is an apparent exception. Though there has been a fall in tuberculosis from 1891 to 1907 corresponding to the drop in typhoid, there were evidently other factors or some difference in the character of the statistics to account for the gradual increase of tuberculosis from

1894-1899 and its sudden drop in 1900 and 1906.

It is exceedingly difficult to calculate how much reduction of tuberculosis there should be for a reduction of every 100 cases of typhoid. We have no statistics as to the prevalence of either disease except in a few limited communities. Even where typhoids are reported the mild cases are often overlooked—generally so in children. The death rates give no information either, for in severe infections, such as

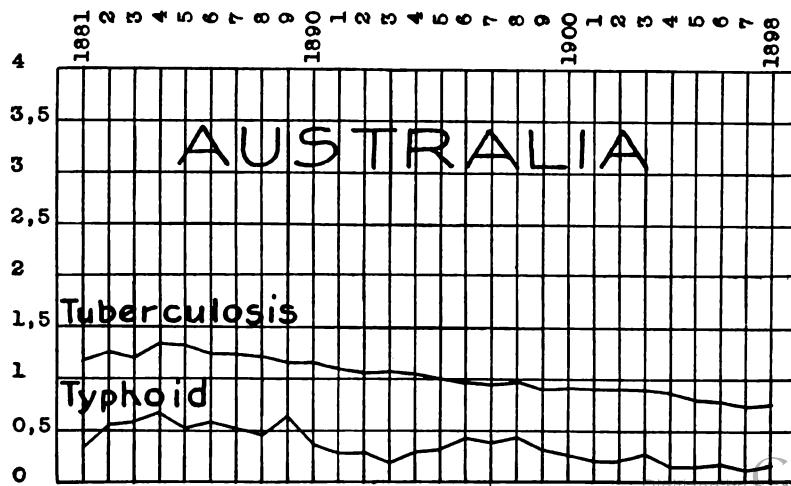


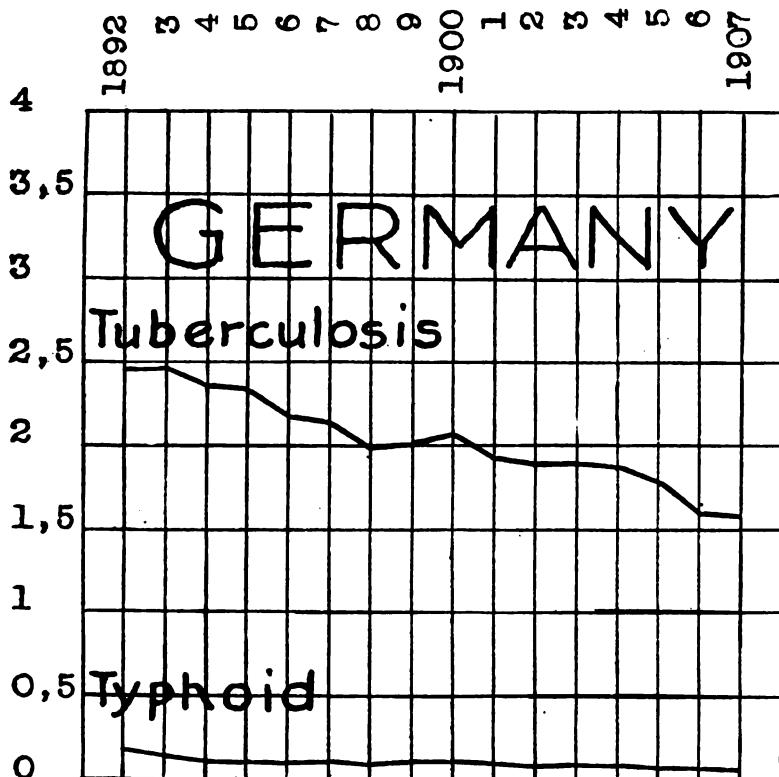


hospital cases or in the tropics where resistance is reduced, the case mortality may be as high as 25 or even 30 per cent. while in family practice it may be as low as three or even two per cent. Taking in the unrecognized mild infections, bedridden but a short time or not at all, it is safe to say that of every 100 infected five will die. Doubtless every human being in civilization is infected with typhoid sometime in his life, but the above estimate refers solely to those whose resistance is so low that they allow the invaders to flourish more or less for a time. We have already estimated that at least two per cent. of the

population has tuberculosis in such a condition that it becomes worse in typhoid. Consequently we would judge that for every five lives saved from typhoid death, there would be a reduction of two or three in the consumption deaths.

Now the curves show that for every reduction of five deaths by typhoid, there are more than three lives saved from death by tuberculosis in the time covered by the charts. In England there was a reduction of about 22 or 23. In Scotland about 19, very roughly estimated. In Ireland only 9 or 10, Germany about 35 or more, but in France where other infections

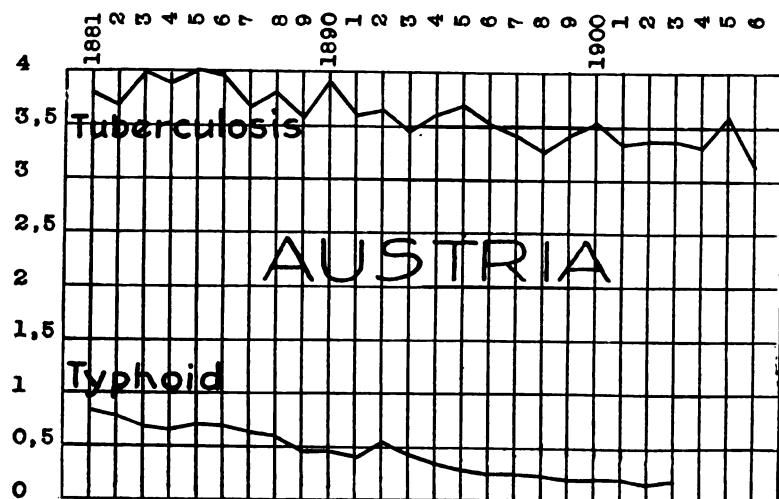


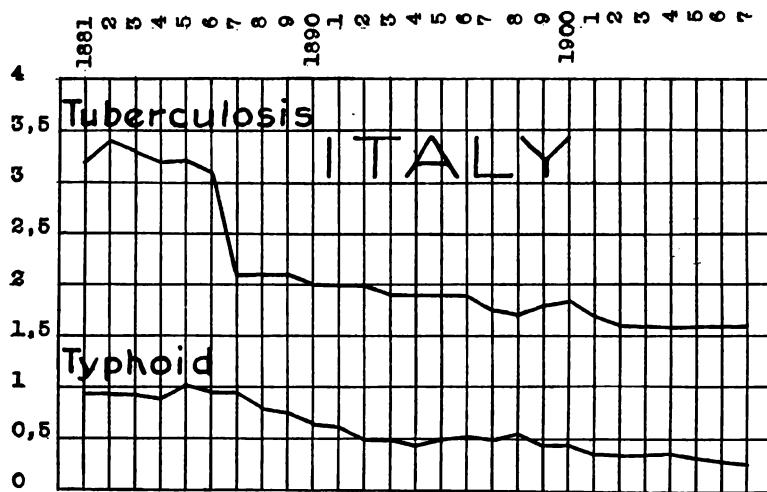


are still high there is little reduction of tuberculosis. In Denmark there is a reduction of about 28 but in Italy only about 4. In the United States it is about 35. These differences can be accounted for by the co-incident reduction by modern sanitation

and therapy of the thousand and one factors which cause active tuberculosis.

Karl Pearson, the eminent statistician, warns against drawing conclusions from parallel curves, as it not infrequently happens that there are two independent causes

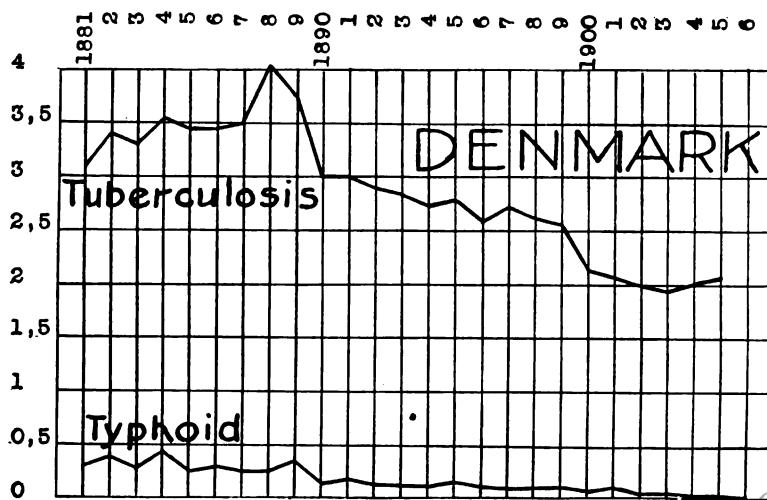


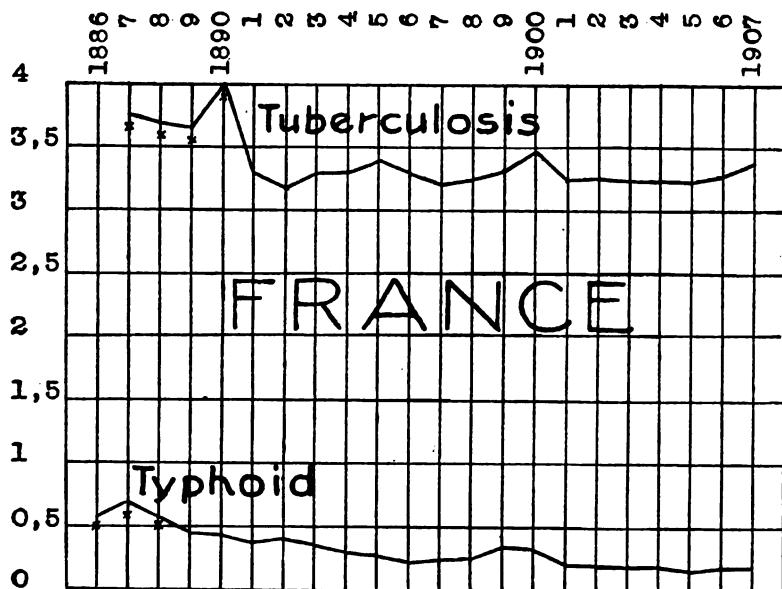


at work, one for each set of facts and wholly unrelated. But in view of the evidence that typhoid is frequently followed by tuberculosis, there can not be any reasonable doubt that the reduction of typhoid is responsible for a good share of the modern reduction of tuberculosis. Where the other infections are high, as in France, tuberculosis is still common, but where public health measures are effective the drop in tuberculosis is amazing.

Pearson has come to the conclusion that the reduction in tuberculosis mortality is an evidence of evolutionary racial change,

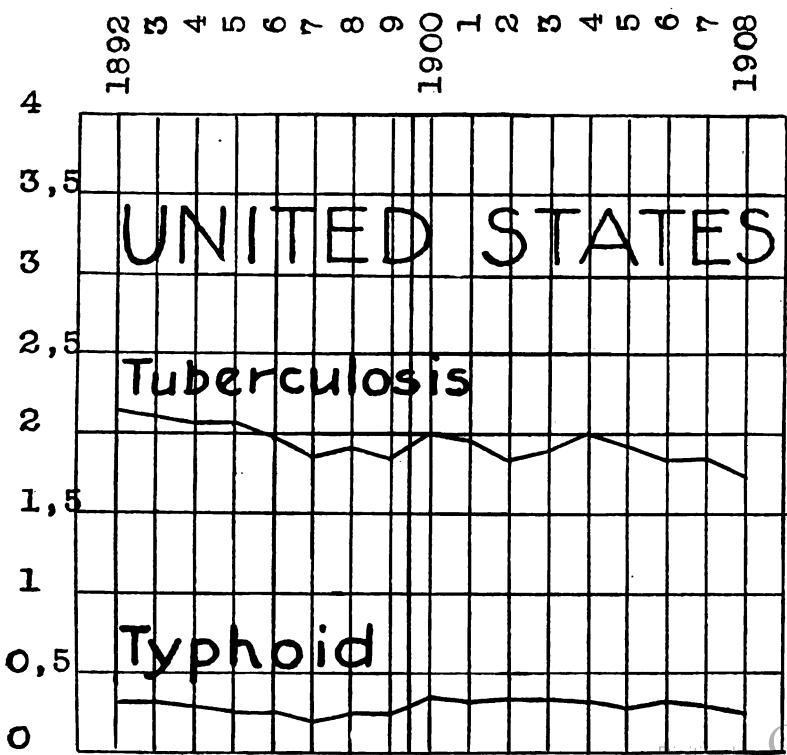
adjusting us to new conditions by slaughter of the unfit and survival of those fit to live in modern industrialism. He is doubtless partly correct, for the drop in the curve began long before sanitation was a factor, long before we knew that it was an infection and of course long before we knew that every one had it. Industrial nations are far more immune to the parasites than they were 100 years ago. In addition tuberculosis is common in any race or type which migrates to an unfit climate—as the blond Homeric Greeks in Greece, the Irish in New York and

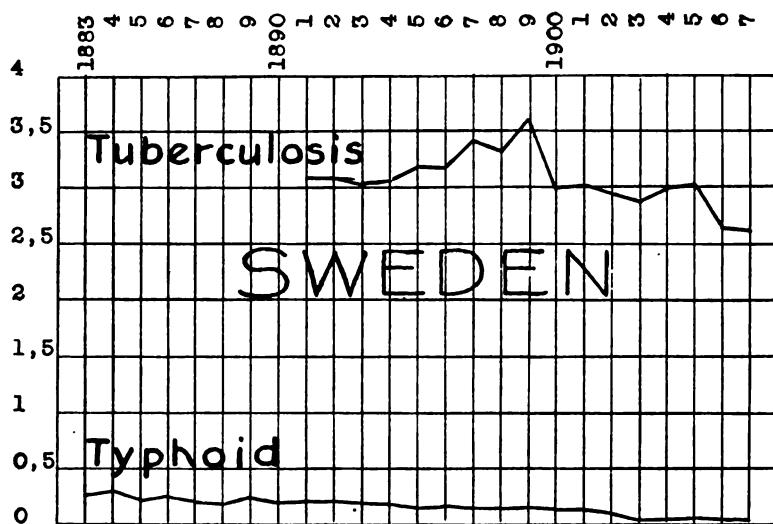




Boston and the Scandinavians in our Northwest. The tuberculosis death rate for the various races, in New York City is a measure of their respective unfitness. Nevertheless typhoid and the other infec-

tions are factors too, perhaps mere instruments for the removal of those least fit to harbor tubercle bacilli harmlessly in factory life. This view is strengthened by the fact that the charts show that whereas





30 or 40 years ago, there was a death from typhoid for every 6 or 7 from tuberculosis, the proportions are now changed and there is but one typhoid death for every 12 or 15 tuberculosis deaths as in Great Britain or 30 as in Germany, or 40 as in Denmark. In Australia, where industrialism has not yet increased the tuberculosis, there are only five deaths to one from typhoid. As a rule, the higher the typhoid rate the nearer do the two classes of deaths approach an equality. As time progresses, typhoid ceases to be a cause of tuberculosis mortality.

One of the most remarkable instances of

the reduction of tuberculosis by reducing typhoid is in the British Army. All other armies show similar phenomenon but not nearly to such an extent because none of them have been bothered so long with such a typhoid mortality as has tormented the 70,000 troops in India until modern sanitation was applied. The table of admission rates per 1,000 effectives for the whole army omits the figures for South Africa during the Boer War 1899-1902, as these unusual conditions disturb the "peace" curves too greatly to obtain proper generalizations.

Admission rates per 1000 effectives, British Army.  
(South African figures 1899-1902 omitted).

Enteric Fever		Tubercular Diseases.
1897	12.5	3.3
1898	17.5	2.9
1899	8.0	3.0
1900	6.0	3.6
1901	6.5	4.2
1902	9.8	3.2
1903	11.5	2.9
1904	10.7	2.4
1905	6.8	2.2
1906	6.3	2.4
1907	5.7	1.1
1908	5.9	1.1
1909	3.8	1.9
1910	2.2	1.8
1911	1.7	1.7

Almost all of the typhoid is contracted in India, and by newly arrived troops, those of longer residence furnishing the smaller percentage. Hence when no troops were sent to India during the Boer War, typhoid immediately dropped, thus causing the remarkable drop in the whole army from 17.5 in 1898 to 6.0 in 1900. The 4,000 antityphoid vaccinations done by Sir Almoth E. Wright late in 1898 and early in 1899, could have caused only 2.35 of a drop. As soon as the "reliefs" began to arrive in 1902-3, typhoid at once rose to the normal for that period of sanitation. Then began that wonderful sanitary campaign which has almost glorified the British Army Medical Department—particularly the hard working part of it in India. Typhoid began a remarkable drop which has not yet ceased. Antityphoid vaccines had little or nothing to do with the first two-thirds of this improvement. In 1903 they were forbidden, but were begun again late in 1904 in accordance with the recommendation of a committee appointed to study it. Not until 1907 did the numbers volunteering amount to more than a small percentage of the force and by that time typhoid was reduced to less than 50 per cent. of what it was in 1903. The numbers inoculated did not amount to  $\frac{3}{5}$  of the Indian force until 1910 but in 1909 the fever cases for the whole army were reduced to less than a third of what they were when inoculations were begun. From then on the inoculations came into play, yet in 1910 only about 60 per cent. of the Indian army were protected but the typhoid of the whole army was reduced to 1.7 per 1,000 for 1911.

The reduction of typhoid by sanitation alone has probably been much greater than

the figures show, because the deaths were reduced  $\frac{2}{3}$  between 1897 and 1907 while the admissions were reduced a half. The disease may have become lighter and deaths fewer, and surely the therapy was better, but the main reason was the habit of calling mild typhoids "simple continued fever" or "undetermined fever." From 1905 there has been much care to determine that cases returned as typhoid were really such, and this has the opposite effect of excluding undemonstrable cases from the statistics and magnifying the reduction of the disease. Formerly when only severe cases were called typhoid, the case death rate was 25 per cent.; then it fell to 16, and is now 11. Some of the last reduction may be due to the vaccine, for the reports seem to be unanimous that if one is infected before the immunity fades the cases are lighter and death rate less.

The tuberculosis admissions show equally astonishing reductions. The normal for the army in 1898 was about 3.00 per 1,000, but the Boer War caused an increase to 4.2 in 1901, probably due to the enormous number of typhoids invalidated home. The war itself had little influence, indeed the outdoor life in that high and dry climate seemed to prevent or cure tuberculosis, as the rate for the whole period in South Africa was only 6.15 or far less than for the army as a whole. After 1903 tuberculosis declined at nearly the same rate as the typhoid until a minimum was reached in 1907-8. Then came an unexplained 70 per cent. increase to 1.9 following the large number of inoculations, and a later slight decline in 1910 and 1911 corresponding with such reduction of typhoid as would have been occasioned by continued improvement in sanitation.

Admission per 1000 U.S. Army.

Typhoid Fever		Tuberculosis of the Lungs.
1890	4.91	3.65
1	3.95	2.93
2	6.62	3.27
3	7.04	3.28
4	6.07	2.96
5	4.32	2.42
6	5.50	3.24
7	5.55	3.21
8	141.59	3.70
9	20.80	3.98
1900	9.74	4.92
1	6.42	4.59
2	6.99	4.38
3	5.14	3.89
4	4.77	4.26
5	3.39	4.22
6	6.15	4.50 <u>all t.b.</u>
7	3.87	4.59 <u>soldiers only</u>
8	3.29	3.81      4.39
9	3.59	4.00      4.53
1910	2.35	3.12      3.65
11	.78 anti-typhoid inoculation	3.13      3.55
12	.27 compulsory.	3.08      3.49

The same dependence of tuberculosis upon typhoid fever is also seen in the U. S. Army after 1890 when bacterial diagnosis was more common as in civil life. As a rule the two rise and fall together. The typhoids of 1898-9 were largely discharged during convalescence and did not have any

effect in raising the tuberculosis rate. Many volunteers entered the soldiers' homes years later with tuberculosis when the disease had advanced to the point of disablement. In 1911 tuberculosis ceased to decline with the typhoid.

Typhoid and Tuberculosis Admission Rates  
per 1000. American Navy.

	Typhoid	Tuberculosis
1890	3.4	0.15
1	3.21	3.05
2	6.01	6.70
3	3.89	6.04
4	4.23	7.58
5	2.35	3.25
6	3.84	3.45
7	3.30	3.74
8	4.54	4.16
9	6.43	4.41
1900	7.36	5.26
1	3.90	4.87
2	4.03	4.36
3	5.04	6.44
4	4.29	6.33
5	4.16	6.61
6	5.40	4.60
7	5.37	4.61
8	3.32	5.76
9	3.30	6.14
10	3.30	5.27
11	3.61	4.89
12	.92	3.86

General use of Anti-typhoid vaccine commenced in Feb. 1912.

Tuberculosis has been alarmingly prevalent in all modern navies on account of the overheating of ships and possibly other factors. Consequently the disease does not show the same close dependence upon

mission rate in 1881-6, varied from 4.1 to 8.1 in various parts of the Empire, but in 1909-10 it varied from .25 to 1.50. The tuberculosis rates in the early period varied from 2 to 3.5 and in the latter from 1.00 to

Rates per 1000 German Army

	<u>Typhoid</u>		<u>Tuberculosis</u>	
	Cases	Deaths	Cases	Deaths.
1900/01	1.60	.17	2.0	.27
1901/02	.90	.10	2.1	.26
1902/03	.85	.09	1.9	.26
1903/04	.89	.11	1.9	.20
1904/05	.63	.08	1.9	.26
1905/06	.67	.08	1.9	.23
1906/07	.41	.06	1.8	.20
1907/08	.50	.06	1.8	.19
1908/09	.38	.05	1.7	.19
1909/10	.40	.05	1.9	.20

In German cities of over 15,000, the relation is more evident, as shown by the following deaths per 1000 population.

	<u>Typhoid</u>	<u>Tuberculosis of the Lungs.</u>	<u>Tuberculosis Total</u>
1897	.10	2.30	
1898	.09	2.14	
1899	.10	2.22	
1900	.11	2.23	
1901	.11	2.06	
1902	.06	1.99	
1903	.07	1.94	
1904	.07	1.91	
1905	.06		2.23
1906	.06		2.03
1907	.05		1.98
1908	.05		1.92
1909	.05		1.83
1910	.04		1.78
1911	.06		1.73

typhoid in the American navy as in the Army. Nevertheless the relation is evident, though the maxima and minima of tuberculosis are a year or two after those of typhoid.

In the German Army, the typhoid ad-

2.80. After 1901 when typhoid was well reduced to a near-minimum, the further reductions had less effect on the tuberculosis rates as the typhoid was then the cause of only a small percentage of all cases.

In the French Army the two diseases are very prevalent and spasmodic due to the occasional serious local epidemics of typhoid. In Africa the typhoid admission rate dropped from 29.5 in 1897 to 13.27 in 1911, but the tuberculosis rate fluctuated irregularly between 3.94 and 6.79 and did not decline with the typhoid. The convalescents probably were sent home and if they did develop tuberculosis later they

respondence between typhoid and tuberculosis as in the country at large. The city consumptive quite frequently goes somewhere else to die, and even if he stays home the death may not occur until years afterward, though as a rule the course is quite rapid. Strangers visiting cities are not infrequently attacked and if they die it figures in the city rates, but if they recover of typhoid and subsequently die of tubercu-

French Army, Total Cases at home and North Africa.

	Typhoid	Tuberculosis.
1897	5735	4012
98	4880	3957
99	7071	3520
1900	4697	3481
01	3640	4005
02	3219	3995
03	4358	4050
04	3840	3610
05	2716	3411
06	3192	3577
07	2585	4136
08	2436	4308
09	2202	3887
10	2006	3887
1911	2591	3177

raised the home statistics, as tuberculosis has varied very little in the above period although the typhoid rate has declined from 7 or 8 to 3.70 or less. The relation between the two is evident in spite of erratic epidemic fluctuations if we combine the admission both home and abroad as in the following table. Rates are not needed as the army strength did not vary materially.

The health authorities of both New York and Pennsylvania have reported that typhoid and tuberculosis have markedly declined in their respective states in recent years and at about the same rate. For several reasons the rates of individual cities do not show the same accurate cor-

losis, it is not noted on the city returns. Finally there are no ways of determining the exact population in America except in census years, and the death rates are more or less accurate estimates. None of the curves are as smooth as in cities and countries of the old world where the census is more frequently taken. In spite of all this, the tuberculosis rates in the accompanying table show a tendency to rise and fall with the typhoid. The typhoid figures are largely taken from Dr. C. F. Bolduan's article in Bulletin Health Department, New York City, January, 1913 reprint series, and from direct inquiries to the health officers.

## Death Rates per 100,000 Population.

## Typhoid Fever and Tuberculosis of the Lungs.

Year	Berlin	Hamburg	Vienna	Paris	London	New York	Boston	Chicago	Washington	Philadelphia
	ty.	tub.	ty.	tub.	ty.	tub.	ty.	tub.	ty.	tub.
1890	9.1	281	26.2	284	9.4	540	28.2	447	14.8	213
1891	10.4	279	26.2	266	6.2	518	22.7	424	13.0	201
1892	8.3	250	34.5	261	8.3	486	28.0	408	11.4	188
1893	9.4	266	17.6	240	8.0	454	22.8	414	16.7	190
1894	4.2	231	6.0	211	5.1	447	27.4	387	14.6	169
1895	5.7	234	9.2	215	5.8	466	10.6	410	14.0	177
1896	4.7	219	5.4	209	5.2	469	10.1	388	13.4	168
1897	4.0	210	7.1	207	5.4	387	9.7	368	13.3	172
1898	4.3	200	4.6	180	6.8	349	9.9	375	13.0	173
1899	4.1	219	3.7	199	4.1	381	29.0	380	17.6	184
1900	5.8	233	3.4	203	8.3	379	34.6	382	16.5	173
1901	4.7	219	4.0	183	4.5	362	15.8	371	12.1	165
1902	2.7	205	4.0	182	3.0	344	16.7	361	12.0	159
1903	3.2	194	4.0	166	3.9	334	13.7	350	8.6	154
1904	3.7	208	4.0	158	3.4	314	15.4	356	2.6	162
1905	5.3	214	4.0	155	4.4	328	11.2	367	5.6	141
1906	4.6	186	4.0	149	4.9	289	13.5	347	5.8	145
1907	3.8	183	3.0	149	2.6	287	10.0	246	4.3	140
1908	3.6	181	4.0	133	4.3	275	8.3	349	5.1	131
1909	4.4	178	3.0	131	3.0	271	9.4	330	3.0	131
1910	3.6	175	5.3	126	4.1	264	6.7	4.3	125	11.6
1911	3.1	168	4.5	122	2.6	266			3.2	135
1912	1.9	167	3.2	120	2.2	245			2.6	135

Greater New York 1896-1913.  
Chicago - all forms of tuberculosis.

The Spanish war added to the deaths in many cities in 1898-9 and the Boer war increased London's rate in 1899-1900. The disasters of these wars stirred up the world to inaugurate an anti-typhoid crusade which showed immediate results. In Boston and Chicago this last decrease of typhoid began in 1899, London 1900, Paris and New York 1901, Washington, D. C. 1902, Philadelphia has been improving since 1892, but it had relapses in 1898-9 and 1906-7. Its real reform began in 1907.

All this improvement is reflected in the tuberculosis rates as seen in the accompanying tables and though there are a number of exceptions to the rule they may prove to be artefacts.

Chicago follows the rule though for the following reasons the figures do not show it. The enormous increase of typhoid in 1891-2 was probably due to the influx of strangers to build the exposition. They lived in bad conditions and unquestionably had more typhoid than the permanent residents, and those who developed tuberculosis returned home to die. Prior to 1903, the deaths at the Dunning Institutions outside the city limits were not included in the statistics though the several hundred consumptives there were residents of Chicago. This accounts for the fact that Chicago in 1890 had a better record than any large city in the world. The inclusion of the Dunning deaths since 1903 has run the rates up so that the city now ranks with the American cities which all seem to be worse off than European cities except Vienna and Paris. Since 1906 the Chicago rates have been kept up by an influx of Lithuanians and Slavs who so promptly melt away from tuberculosis in this en-

vironment which is so different from their normal.

Making due allowance for these disturbances the Chicago deaths from tuberculosis are seen to have diminished with the typhoid as in all other places in the world. The great reduction of typhoid in 1911 and 1912 is said to be due to the use of hypochlorite to disinfect the water supply, and there has not been time for the lessened tuberculosis to be evident.

Washington shows the same general trend as other places and in the long run the reduction of tuberculosis has kept pace with that of typhoid, but there are irregularities probably due to the fact that it is a city of strangers and temporary residents who go home to die if they get tuberculosis, but who die in the city if they contract typhoid. The negro element seems to keep the tuberculosis rate higher than any other place except New York where the foreign born—particularly the Irish—keep up the rate for this disease.

Since a death from tuberculosis may not occur until some time after the activating typhoid, the five year periods show the parallel fluctuations of the two diseases somewhat better than the yearly rates, as shown in the accompanying table of Boston City rates since 1856. It will be noted that both began to come down in the early 80's, coincidently with the beginning of serious scientific sanitation, and fifteen years before the modern anti-tuberculosis and anti-typhoid movements were more than academic discussions. Hoffman's charts show that the tuberculosis mortality declined in New York, Philadelphia and Boston about 1880-2. The total death rate in Boston did not vary much from 1865 to 1900 when it was 20.80. It then gradually declined

to 17.08 in 1911, but the tuberculosis and typhoid decline began long before this.

Measles occasionally caused very high death rates in Boston up to 1862 and must have been responsible for some of the tuberculosis, but after 1862 there was a phenomenal decrease in these deaths and the rates though varying greatly from year to year have not decreased materially on the average, and could not therefore have been responsible for any of the remarkable decrease of tuberculosis since 1865 or 1870.

that the intestinal infections of children and typhoid of adults largely account for the former prevalence of tuberculosis in that city, although the spread of population to the suburbs has had some effect in reducing the rate.

There has been a gradual reduction of case mortality of typhoid in Boston from 26.8 to 12.60 in 1911, due probably to better therapy, nevertheless it is more than likely that many typhoids were not recognized in the early years and that the re-

Rates per 100,000

Boston, Mass.

<u>Typhoid</u>	<u>Tuberculosis</u>
<b>1840-1845</b>	<b>290.9</b>
<b>1846-1850</b>	<b>445.0</b>
<b>1851-1855</b>	<b>473.6</b>
<b>1856-1860</b>	<b>450.8 (omitting 1860)</b>
<b>1861-1865</b>	<b>422.7</b>
<b>1866-1870</b>	<b>381.3</b>
<b>1871-1875</b>	<b>403.4</b>
<b>1876-1880</b>	<b>374.5</b>
<b>1881-1885</b>	<b>407.9</b>
<b>1886-1890</b>	<b>352.7</b>
<b>1891-1895</b>	<b>288.3</b>
<b>1896-1900</b>	<b>242.3</b>
<b>1901-1905</b>	<b>216.8</b>
<b>1906-1910</b>	<b>175.7</b>
<b>1911</b>	<b>154.9</b>
<b>1912</b>	<b>151.8</b>

Scarlet fever also caused much mortality up to 1876 when it took a sudden drop which had no apparent influence on the tuberculosis rate, though it has been declining ever since and about parallel to the tuberculosis on the average.

Diphtheria reached its highest rate 20.86 in 1876 and then declined slightly until its sudden drop after the popularization of antitoxin, but the curve does not seem to bear any relation to tuberculosis, as the decline from 1905 has only been from 2.21 to 1.50. There is no reason then to doubt

duction of cases is much more marked than the statistics show. This, if a fact, would help to account for the remarkable reduction of tuberculosis from 1850 to 1890. The relation of typhoid to tuberculosis is brought into greater prominence by the fact that there has been an appalling increase in the death rates of pneumonia, cancer, heart disease and kidney diseases, people who formerly died of typhoid and its sequelae, but are now saved to die of diseases of old age.

The tuberculosis death rate in New York City follows the general death rate very closely as shown in the table—in marked contrast to Boston. The figures seem to indicate that New York had been more backward in eliminating the non-typoidal causes of tuberculosis.

Nevertheless there has been a nearly continuous reduction of the death rate

phoid fever, diphtheria and pulmonary tuberculosis. There has been little change in the mortality from measles, scarlet fever, bronchitis, and a well marked increase in the diseases of men over 50, i. e. pneumonia, cancer, Bright's disease and heart disease. The cases of diphtheria have not been reduced so greatly as the mortality, because antitoxin saves them. Hence the main

New York City (Manhattan and the Bronx) 1881-1912.

	<u>General Death Rate</u>	<u>Death Rate Tuberculosis</u>
1881	31.04	4.92
2	29.61	4.72
3	25.80	4.51
4	25.82	4.45
5	25.55	4.26
6	25.94	4.42
7	26.32	4.06
8	26.39	3.99
9	25.32	3.86
1890	24.87	3.97
1	26.31	3.56
2	25.95	3.55
3	25.30	3.51
4	22.76	3.16
5	23.18	3.35
6	21.84	3.11
7	20.03	2.98
8	20.46	2.99
9	19.81	3.08
1900	21.03	3.00
1	20.44	2.85
2	19.11	2.63
3	18.56	2.70
4	21.00	2.71
5	18.91	2.86
6	18.71	2.72
7	18.76	2.68
8	16.82	2.58
9	16.42	2.45
1910	16.41	2.40
11	15.78	2.35
12	14.65	2.21

since 1866 when the Health Department was organized. The rate was 36.31 in 1866, 27.90 in 1868 and 14.65 in 1912. Life has been greatly prolonged as shown by the enormous reduction in mortality in all ages less the forty-five and an increased mortality above that age. The chief diseases showing less mortality are smallpox, ty-

causes of tuberculosis reduction must be the diminution of smallpox and typhoid fever, but the amount of smallpox at any time has been too small to account for much. In the last part of the period there has been a great saving of infants from prevention of gastrointestinal diseases and this too helped to reduce tuberculosis,

The above table taken in groups of five years shows the trend more accurately. There is no exception to the rule that a decrease of typhoid is accompanied by a decrease of tuberculosis. There are four instances of an increase of typhoid not followed by an increase of tuberculosis but they are all minor grade and do not affect the general trend. In each case it was due to a short period of exceptional prevalence of typhoid (Berlin 1905-9, New York 1900-4, Boston 1895-9 and Philadelphia 1905-9).

The 1900 census shows that the worst districts for tuberculosis are the southeastern states. Here also are the highest rates for typhoid and malaria, though both extend

fell from 1464 to 524 and the home rate from 712 to 346. There was no special crusade against tuberculosis and yet the Indian cases fell from 354 in 1896 to 92 in 1911. That is, tuberculosis seems to be largely a secondary disease, following other complaints, chiefly the infectious.

In respect to non-tubercular diseases made worse by typhoid, Vincent (*ibid*) mentions many which are adversely affected by anti-typhoid vaccine; and Spooner (*ibid*) says that every latent or chronic non-typhoidal disease is made worse by it and though there was prompt recovery as a rule some "accidents" occurred. The instructions as to the vaccine emphasize the caution not to use it if there is any sign

	BERLIN.		HAMBURG		VIENNA		PARIS		LONDON.	
	Typh.	Tuber.	Typh.	Tuber.	Typh.	Tuber.	Typh.	Tuber.	Typh.	Tuber.
1890-4	8.28	261.4	22.11	248.4	7.40	488.8	25.82	416.0	14.10	192.2
1895-1899	4.56	216.4	6.00	202.0	5.46	398.2	13.84	384.2	14.30	174.8
1900-4	4.02	211.8	3.84	178.4	4.62	346.6	19.04	363.9	10.36	162.6
1905-1909	4.34	188.2	3.60	143.4	3.84	290.0	10.48	325.8	4.68	137.3
1910-12									3.33	131.6
 NEW YORK.										
1890-4	21.2	300.0	31.50	300.4	96.10	201.8	88.74	310.6	48.32	243.4
1895-1899	16.72	260.2	32.04	246.0	37.56	179.4	63.10	288.2	46.74	207.4
1900-1904	19.12	239.4	23.62	225.6	28.78	174.0	58.74	257.2	46.82	217.0
1905-1909	14.56	231.0	17.64	182.0	16.80	172.8	39.56	230.0	47.04	201.6
1910-12	10.83	199.6	9.53	159.6	10.66	168.6	22.06	209.3	18.00	178.0

west of the Mississippi where better climatic conditions seem to keep down the tuberculosis. The only places where there is little typhoid and much tuberculosis are health resorts where consumptive visitors are numerous.

Sir Wm. Arbuthnot Lane reports cures of tuberculosis by eliminating intestinal autointoxication. Similarly modern sanitation by the prevention of intestinal infections is reducing tuberculosis. This is well shown in the British Army where the admission rate for all diseases has been reduced from 997.2 in 1889-1898 to 421.1 in 1911. Most of this improvement was due to tropical sanitation, for the Indian rate

of disease or debility. Prendergast gave the vaccine to four diabetics to reduce the sugar (*N. Y. Med. Rec.*, Jan. 3, 1914). One developed tubercle bacilli in the sputum six weeks after treatment was discontinued, and another during treatment dying on the ninth day after the last dose. It is evident that the more numerous bacilli in an attack of typhoid will do far worse.

We are therefore able to explain the phenomenon discovered by Mills and Reincke and reduced to a mathematical formula by Hazen:—"the decrease in mortality from diseases other than typhoid fever following the purification of public water supplies." Hazen calculated that for

every life saved from death by typhoid, there are two or three saved from death by other causes. Sedgwick and MacNutt (*Journal of Infectious Diseases*, August 24, 1910) after an elaborate and painstaking investigation have concluded that the saving was far more. Reincke found that after Hamburg's water supply was purified there was a great reduction of the infantile death rate, chiefly from all gastrointestinal diseases. Some of these were possibly typhoids. There was also a reduction of inflammatory diseases of the respiratory tract. It is significant that pneumonia and bronchitis are often sequelae or complications of typhoid fever, and that many are unrecognized tuberculosis. Sedgwick says "Polluted water supplies appear to increase the general mortality of communities from tuberculosis, pure water supplies to diminish that mortality." (*Tuberculosis in Mass.* 1908).

cle bacillus thrives only in soil in which other ailments have done the spade-work, as so aptly put by Peter Daniel of London. Prevention of tuberculosis is accomplished indirectly by preventing everything else.

For instance, before the anti-tuberculosis work of the New York City Health Department was organized in 1894, the average yearly reduction of tuberculosis deaths was considerably more than since. The sanitary work for which this department is justly famous, must therefore be given more credit than the specific measures directed against the spread of the tubercle bacilli—and this does not belittle the great good accomplished by the anti-tuberculosis movement.

The next table shows the state of affairs in various armies of Europe at the date of the last available reports. Algerian troops invalided to France after typhoid lower the African tuberculosis rate and raise that of the home army. The Austro-Hungarian

#### ARMY ADMISSION RATES PER 1000

<u>Country</u>		<u>Typhoid</u>	<u>Tuberculosis</u>	
			<u>Lungs</u>	<u>All</u>
French Algiers	1911	13.27		4.04
Spain	1910	7.03	6.81	6.16
Japan	1909	5.47	3.85	5.11
Russia	1910	5.02	2.09	3.51
France (home)	1911	3.70		6.04
	1910	2.38	4.73	6.15
British	1911	1.70	1.30	1.70
Austria-Hungary	1910	1.30	1.40	4.05
Holland	1910	.51	4.82	5.92
United States	1912	.27	3.08	3.49
Prussia	1911	.19	1.40	1.86
Bavaria	1910	.13	1.40	1.64

All diseases of an exhausting nature then seem able to light up an inactive tubercular lesion or make it more rapid if already active. Syphilitics and diabetics for instance seem to have far more tuberculosis than the rest of the population. That is, the tuber-

report shows less tuberculosis of the lungs than of the other organs—a palpable clerical error. With the exception of the Dutch and American troops there is a remarkable correspondence between typhoid and tuberculosis. Tropical cases may increase the

Dutch rate. In apparently healthy men in the third decade of life, about 1.5 per 1,000 contract tuberculosis of the lungs yearly from non-typhoidal causes in military life, which is not an ideal one by any means. If more break down there are other causes, chiefly typhoid bacilli.

Finally, in practical therapy, it would be wise to treat typhoids as though they were tubercular. Indeed they do better anyhow if liberally fed and kept in cool or cold air.

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Since the above article was put in type, Dr. Ralph Matson, Director of the Portland Open Air Sanatorium, has written that seventeen per cent. of his cases give a history of previous typhoid, and that he estimates that the tuberculosis is a direct sequence in ten per cent. of all his cases. Two recent cases attributed their tuberculosis to typhoid vaccine received when in apparent perfect health. They volunteered the information without question on his part.

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## TRACHOMA AS A SOCIOLOGIC INDEX.

BY

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Philadelphia.

Trachoma is a very important disease of the eye found in nearly every country of the globe, affecting usually the members of the lower strata of society, resulting quite often in a marked reduction in the acuity of vision, disqualifying them from the pursuits of the more intelligent occupations, requiring a higher degree of vision, and in some countries it not rarely leads to unilateral or even bilateral blindness. This disease is unequally distributed in various countries and even in the same country in different districts. The disease is a poor man's disease and hence is more prevalent in that part of a country where the economic conditions are much below normal and the social conditions have not as yet

reached the stage compatible with our ideas of civilization. Trachoma is indeed a good index of the economic and social conditions of the district it inhabits. Where trachoma is a scourge the social and economic status is very low. The medium of transportation is in a primitive stage. No railways; no electric cars; no modern dwelling places; no money, and no culture. The people are of a primitive type. It is usually found in a district the chief pursuit of which is agriculture. The manufacturing districts are not seriously affected, unless it be infiltrated from the agricultural districts. Large cities are comparatively free from this disease and where it is found it usually appears in a very mild form, showing that in civilized surroundings, the disease because of better hygienic conditions becomes less virulent. It is also less contagious in direct proportion as its virulence is lessened. The chances for spreading the disease certainly are greater in large cities where the people intermingle in various places; school, workshops, restaurants, and public vehicles, and market places, boarding houses, etc., yet the fact stands that cities are free from epidemics, and severe cases are not often seen. Even of the ordinary mild cases that we observe in large cities the majority of the patients come from the rural districts rather than from the city itself, an important fact to remember in studying the predisposing causes of the disease.

Trachoma constitutes an important problem in various countries, the solution of which is engaging the earnest attention of their respective governments. That the efforts of European governments in dealing with this disease have as yet been crowned with little success is due directly to the low standard of life of the people in the tracho-

matous districts. The student of trachoma must therefore necessarily inquire into the social, political, and economical status of the people in order to fully grasp the situation, and fully realize the contributory causes that are mainly responsible for the disease. No one can conscientiously suggest a remedy for the condition unless he is thoroughly acquainted with the ins and outs, the lives, habits, customs, and general culture of the people. Each country having different social and economic conditions to combat, will have to use special means in preventing the spread of the disease; means compatible with its own political and social conditions. Means that would be most effective in a civilized country would be of no avail in a country in which primitive life of barbaric tribes is still the ruling force among the multitudes of the public.

**The Historical Aspect of Trachoma.**—Trachoma is endemic to every country. Whence it came when it began to develop is somewhat clothed in mystery. There are no special records that would enlighten us on this subject. The general and accepted theory is that it developed in Europe in 1789 when the army of Napoleon returned from Egypt.

It is a well established fact that the army of Napoleon while in Egypt developed Egyptian ophthalmia in a severe form. About 20,000 soldiers contracted the disease and on their return home they carried the contagion with them to Europe. The governments alarmed by the severity and contagiousness of the disease in order to prevent the further spread of the disease among the army men, decided to send the affected home to their various places, and thus the disease spread not only in military circles but also among the civilians. Nearly

every country in Europe became infected at the time. The disease appeared in such severe form that it practically disabled the soldiers from actual service. The history of trachoma begins from this period, for it became the object of investigation. While it is true, however, that trachoma has attracted the attention of scientific observers at this particular period, it must likewise be conceded that the disease existed in Europe long before that, probably in a more chronic form. It was the acute nature of the disease and its infectious character that forced investigation of the subject. Had the disease contracted by the army of Napoleon run a chronic course it would have been overlooked, for then it would not have interfered with its fighting force. It is hard to state with any degree of definiteness whether the Egyptian ophthalmia contracted by the soldiers was trachoma, probably there was some mixed element of infection especially by the gonococci. There is no doubt in my mind that the army of Napoleon suffered with trachoma of a chronic nature prior to their entrance into Egypt but showing no symptoms, having no discharge, it passed unnoticed until the superadded infection in Egypt as a result of the inflammatory symptoms, drew attention of the authorities. Be this as it may it was the epidemic form acquired in Egypt that gave the impetus to the study of the disease.

**Why Was Trachoma Unnoticed in Europe Prior to the Napoleonic Era?**—Trachoma as seen by some of the physicians in large cities prior to the return of the army of Napoleon was considered a chronic conjunctivitis and not much consideration was given the disease. In a serious form it existed probably only in the uncultivated rural districts. It affected

the lowest classes of the state and it did not interfere with the affairs of the country. If vision was reduced markedly the patients could still discern the difference between a cow and horse and that is all that they needed in their daily vocation. Since it did not directly affect the government, no attention was paid to it any more than to any other conjunctivitis which was treated by the patients themselves with various home remedies. Even if the profession had been familiar and we have sufficient evidence that they knew of the disease, still the political, social and economic questions were not so acute, and humanity walked on path of least resistance and no one cared about those affected to make any special study. Governments did not initiate any hygienic laws, nor stimulate any research, unless it greatly interfered with the interest demanded for their own safety. So that as soon as its fighting force was affected, and practically disabled, the interest of the state demanded it, that something should be done to protect the army and thus the medical world got busy and is still busy investigating the infectious nature and the etiologic factor of the disease. That trachoma must have existed in Europe is obvious, even admitting that the disease is an oriental disease, that it had to be carried to Europe by some forces. It still must be remembered that during the nomadic period of European nations many races came to Europe probably bringing this disease with them. The Huns, the Turks, the Arabians, when they invaded Europe certainly could have brought the disease with them. The disease is endemic to all countries and plays an important political part because of the compulsory military service, and the affected regions can not come to the proper

rate if the youth is affected with trachoma, which disease bars its host from military duties at the present time. The nation is thus affected and the disease becomes of national import. The disease is as old probably as mankind and was known in Europe long before the era of Napoleon, in fact it is intelligently described by many writers of the sixteenth century, but probably never appeared in epidemic form until 1879, when it rapidly spread throughout Europe, affecting both the military and lay circles.

**Where is Trachoma Most Prevalent and Why?**—Trachoma serves as a very reliable index to the social, economic and cultural status of the district affected. A district in any part of a civilized country where culture is a common asset of the people, where the social life rests upon a cleanly basis and where the economic condition of the population is on a fair level, trachoma is conspicuous by its absence. Industry, frugality, sobriety, culture, and cleanliness are the chief enemies of trachoma. It simply will not live in modern communities and will not thrive in modern surroundings. Large cities therefore in any civilized country are practically free from this disease. Even in the so-called trachomatous countries one is surprised to hear that their cities are free from the disease which is confined to the remotest rural districts. Occasionally some mild case infiltrates into the cities, but once under the influence of urban atmosphere its contagiousness practically is destroyed so that further infection or transmission of the disease is practically rare.

Trachoma does not thrive in communities where physicians are in abundance, and hospitals attend to the ills of the needy and poor. Show me a country or a district of

a country in which trachoma is prevalent to any considerable extent and I will show you a country or a district of a country where physicians are a rarity, a luxury to be searched for, and found only within a radius of fifty miles, and where hospitals are unknown institutions. It is interesting to note that both in our country as well as in Europe the districts affected with trachoma are about on the same level of social, cultural and economic environment. It may be of interest also to observe that we have in our country districts so badly infected with trachoma that its equal cannot be found in any European country. Not only is it common among the Indians, but it is also very common and dangerous according to the reports of the U. S. Marine Hospital Service in the mountainous regions of Kentucky, Arizona and Montana and other states among the very American natives, many of whom are practically blind from the disease. This state of affairs has been only the recent discovery of those connected with the Marine Hospital Service.

A comparative description of the various trachomatous districts will at once reveal a surprising uniform social condition, responsible for its persistence in this world. It will also modify our accepted and blindly repeated old traditions that trachoma spreads by barracks, prisons, private and public schools, boarding schools, etc., which is not correct. Neither barracks, nor schools, nor prisons, not even tenement houses are responsible for the spread of the disease. In our days the barracks are free from this disease, because it is not permitted to enter there. Our prisons do not spread the disease and surely no one can attribute the spread of it to our public schools. Facts as we see them do not

warrant such assertions. As a matter of fact our schools are free from the disease and even in the trachomatous districts we observe, as a rule, that the higher the grade the less the number of trachoma, and in the high schools it is practically unknown, that surely is no indication for the commonly accepted idea that schools spread the disease. The home, such as we shall describe it in the remote rural districts, where ignorance and poverty are the ruling forces constitute primarily the main spring of trachoma. This fact has long been known in Europe and we are at present beginning to make this wonderful discovery in our country.

Trachoma is a country, a rural disease, and affects certain districts where the disease is permitted to thrive. We shall first give a little description of the trachomatous districts of Europe and then describe the trachomatous districts in our country and see how they correspond in their causal relation. If we take East Prussia, for example, we find that according to Professor Hoppe, "there are very few physicians in the district. In the district of Johanneberg, for instance, there are four physicians to a population of 50,000 residing within an area of 1,680 square kilometers. The difficulties to reach a physician under the circumstances are obvious. One has to travel from ten to twenty miles to see a physician. The transportation medium in these affected districts is neither trains, nor electric cars, but one has to walk or travel on a wagon, which practically means to lose a day or two, every time one has to consult a physician. Trachoma requires daily or every other day's treatment, which under the difficult circumstances becomes absolutely impossible. Those affected are the poor farm hands without any means

and the result is plain neglect." Sanitary conditions there are unknown. These men live in little huts made of lime, even the flooring is of lime. One little window, which is really only an opening tightly closed during the winter, supplies the ventilation. Many of the farm hands sleep in the stable all year around. Bathing or even washing hands and face is a rarity indeed, except perhaps on Sunday, when the face is washed. Many of them are packed together in one room. Occasionally two families live in one room, each consisting of from six to ten members. This room is everything, sleeping room, parlor, dining room and kitchen. The chickens and other domesticated animals occupy the same room, while under each bed you can find in the process of fermentation, the supply of potatoes and other vegetables for the winter season. In some houses you may find a towel hanging on the door which is handled on a communistic basis and is changed once a month. These people live on potatoes and corn bread as the chief article of food. Meat is a luxury indulged in on Sunday, when half a pound suffices for the whole family. For medical purposes, crude home remedies are occasionally used. There are no water closets, and the excreta of men and animals is deposited in the yard. In some places these excrements are dried and used for fuel in winter, as in Alföld, Hungaria. No newspaper reaches these sections of the country except for the priest and nobleman in the district. This, in brief, is a graphic picture of the social, cultural and economic conditions of the districts that constitute the primary source of trachoma in Europe.

**Under What Conditions Does Trachoma Thrive in the United States?**—In the minds of laymen and some patriotic physi-

cians, "trachoma" and "alien" are terms closely allied to each other. Until recently we were led to believe that all trachoma cases in the United States are to be found among the foreigners who constitute a dangerous element in the community. Trachoma commissions in our large cities were appointed, who after investigation (?) advised very strict measures to prevent some dangerous imaginary epidemics. But their conclusions were based on erroneous premises. They consulted old text-books rather than take the trouble to do a little original thinking. According to them, trachoma is an exotic disease infiltrated into the United States by aliens, and since these aliens settle to a very large extent in the large cities, therefore, it must of necessity follow that our large cities are full of trachoma, and since the United States authorities consider that trachoma is a dangerous infectious disease it necessarily follows that in large cities we are in danger from a serious menace of the spread of this disease through the medium of tenement houses, factories and public schools. Those of us who dared disagree with this wonderful logic were actually persecuted. The Church of Science it must be remembered is as intolerant as the Church of Religion. But the searchlight of reason has clarified the atmosphere and we can see things in a different light. We find that according to the annual reports of large ophthalmic clinics, that trachoma cases are rather rare, constituting only 0.2% of the total amount and those are mostly of a mild type. Our schools and asylums were found to be free with the exception of a few mild chronic cases. No infection of any kind could be traced to our schools. After four years of careful investigation I could not trace one case of infection to such source. We

are beginning to learn that trachoma is not an exotic disease, and that it is not a city disease, but rather a rural disease, found in the United States as well as in other countries only in districts where the light of civilization has as yet not entered.

**Trachoma Among the Indians.**—According to Dr. J. W. Schereschewsky, Surgeon U. S. Public Health Service, "trachoma was found to be a veritable scourge among the Indians" as will be amply shown by the figures he presents. According to official figures of the Indian Office, the Indian population in the United States is 322,715. Of this number 39,231 were examined by the officers engaged in the investigation, with the following results:

**Results of the Investigation.**—Out of the 39,231 Indians examined, 8,940 individuals, or 22.7 per cent. of the entire number examined, were found to have trachoma. If this rate of infection were found to prevail for the entire Indian population of the United States, there are, at the present time, some 72,000 cases of this disease among this class of the population.

The persons examined represented both sexes and all ages, and included students in Indian boarding schools, in day schools and mission schools, and reservation Indians.

The accompanying table shows the number of Indians examined in each state, the number of cases of trachoma found, and the percentage of incidence.

TABLE SHOWING PREVALENCE OF TRACHOMA AMONG INDIANS IN DIFFERENT PARTS OF COUNTRY.

State	Indians Examined			Per Cent.
	No.	Cases Trachoma	of	
Arizona	5,873	1,459	24.9	
California	1,555	238	15.3	
Colorado	292	41	15.64	
Florida	22	...	...	
Idaho	526	84	15.96	
Iowa	53	17	32.04	

Kansas	834	176	21.1
Michigan	643	48	7.46
Minnesota	3,542	533	15.05
Montana	2,042	537	26.3
Nebraska	322	130	41
Nevada	851	229	26.9
New Mexico	2,207	494	22.38
New York	943	2	0.2
North Carolina	317	23	7
North Dakota	3,447	791	22.94
Oklahoma	3,252	2,235	68.72
Oregon	904	94	10.4
Pennsylvania	552	76	13.76
South Dakota	6,121	1,059	17.24
Utah	182	75	39
Virginia	43	13	30.2
Washington	1,347	180	13.85
Wisconsin	2,999	207	6.86
Wyoming	392	199	51
	39,231	8,940	22.7

From these figures we can see that trachoma must be quite a serious disease in these remote regions of our country, and it is probable that it existed among the Indians long before they came in contact with other races. Race plays no part in the etiology of trachoma. Under the same circumstances all races have trachoma. The responsible cause for the prevalence of trachoma among the Indians is the same as I described above, when speaking of East Prussia. Dr. Schereschewsky gives the following interesting account of the housing conditions among the Indians:

**Housing Conditions.**—In his savage state the Indian lived an open-air, nomadic life and his tepees, while often dirty, were well ventilated. Since the middle of the nineteenth century, however, the Indians have been confined to reservations and constrained to live in houses. They are still generally ignorant of the elementary principles of domestic hygiene required by a stationary abode. This does not apply, however, to all Indians, many of whom were found to be of unusual intelligence and good sanitary habits.

Their houses together with their domestic and social habits, however, play an important part in the dissemination of trachoma. The typical Indian house is a small, one-roomed frame or log structure, which, in over one-half the instances has a dirt floor. The average Indian family is large, four or five children being by no means uncommon. Personal privacy is generally unknown, and all live and sleep together in the crowded cabin whose doors and windows are carefully shut in the winter, for warmth, the windows being frequently nailed shut. Whatever washing of the

hands and face takes place is done in a common wash-basin, and towels, when present, are used by all members of the family. The bed-clothing, consisting of quilts and blankets, is used, without washing, until worn out, and indiscriminately by the various members of the household. The scanty accommodations of the crowded cabin are likely to be further strained by the advent of visitors who, with true Indian hospitality, are welcomed and may stay days or weeks.

Discharges from the eyes and nose are usually removed by the fingers, which are inadequately wiped on the clothing or any convenient object. It was no unusual sight to see a trachomatous mother removing the secretion from the corners of her eyes with her fingers, and then endeavoring to assist the examiner in examining the eyes of her children.

Add, in the summer time the presence of numerous flies, and the sociable nature of the Indian which delights in visits and social gatherings of all kinds, and the wide-spread prevalence of trachoma among the Indians is readily accounted for.

The housing conditions and general culture certainly agree with those observed in other trachomatous regions of Europe. Strange we should have made this discovery only recently.

**Trachoma Among the Natives in the United States.**—Among the natives of the mountains of eastern Kentucky trachoma has assumed a serious aspect according to Dr. J. A. Stucky of Lexington, Ky. The disease is found in the heart of the mountains, composed of seven counties known as the "pauper country." It is a region where children do not go to school. Dr. Hough says "there are no schools because there are no roads; no roads, because there are no taxes; no taxes, because there is no money." There is no possible interchange of commodities because there are no roads.

The housing condition according to Dr. Stucky is the following:

"In these little cabin homes and rude shacks, windowless, with no opening to the single room but the one door, with a lean-to for a chimney, or piece of stove-pipe thrust through the side of the roof live the entire family of from eight to twenty. In

this room they eat, sleep, cook, live. They all use the same large family towel for days." Dr. A. Von Shelly speaks of the district where "the highways are sewers, the homes and public meeting places huge cuspidors."

There is a positive uniformity of conditions existing in all trachomatous districts, whether it be in the Slavik region of Russia or Hungary, or the German region in East Prussia, the reservations of the United States or the mountainous region in Kentucky. Ignorance, illiteracy, filthy housing, poverty, no roads, absence of physician, medicine and hospitals, are the essential features necessary for the growth and development of trachoma. Trachoma in its earlier stages is absolutely curable, and can reduce the acuity of vision only when neglected or permitted to thrive without any medical interference due to poverty or ignorance. It has always been so and will always be so until better social and economic conditions prevail in the affected regions. Trachoma is an endemic condition, not an exotic, and only a betterment of social, cultural and economic conditions will entirely eradicate it. Trachoma is indeed the best social index by means of which we can judge with a reasonable degree of certainty the cultural, social and economic status of a nation. The increase in trachoma is in inverse ratio to a normal standard of social and economic environments.

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#### LIPOMA OF THE VULVA.

BY

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**History.**—E. M., aet. 11 years, was admitted to the Surgical Division of the Chil-

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dren's Department of the German Hospital with a swelling involving the vulva and inguinal region.

According to the history given by the mother, one side of the vulva was always larger than the other, and, about four years ago, the swelling was quite marked, and has been growing rapidly since.

**Status praesens.**—A well developed and well nourished child. Skin clear; pupils normal; teeth good; throat negative; thorax symmetrical, elastic, expansion normal; lungs negative; heart sounds normal; heart

A few days after admission the child was operated upon. The tumor was removed, and the wound healed by primary union.

The pathological report states: Anatomical diagnosis, lipoma. Gross appearance, specimen consists of a large lobulated mass, about 12 cm. in length by 7½ cm. in its broadest diameter. The whole mass is soft and apparently made up of fat. Microscopic examination shows a mass of fat cells. It is not vascular.

In reviewing the literature of lipoma of the vulva, I was amazed to see how few



LIPOMA OF THE VULVA.

dulness within the normal limit; abdomen soft; no abnormalities. Extremities normal. Starting in the inguinal canal, and extending downward into the left labium majus is a soft swelling, pear shaped; about 13 cm. in length and 8 cm. in its broadest diameter. There is no evidence of a dilated inguinal ring, no impulse on coughing, and the mass cannot be reduced. Palpation gives a sensation like that of an angioma or angio-lipoma. The mass cannot be reduced by pressure.

cases have been observed and reported.

In February, 1884, *A. Jacobi* published an article on Congenital Lipoma in the *Archives of Pediatrics*. He states that lipoma may be developed at any age. It has been observed in old people; and in young infants, even congenital lipoma has been known to occur. It has been met with as an hereditary disease—*Murchison*

has the case of a father and two daughters with fatty tumors in almost corresponding regions. Jacobi then cites five cases of his own, and reports about seventy cases or more from other authors; and, in summing up, states "This collection of cases, extending over nearly a century, proves the rare occurrence of congenital lipoma. Every additional case must be welcome; but it appears that the number of those which have come to my own notice is unusual in the experience of an individual observer."

What I emphasize in my introductory remarks appears to be confirmed by the cases, as far as reviewed.

Few of them were capsulated, most of them diffuse. Some of the patients had both diffuse and localized and capsulated lipoma. Many were uncomplicated. Some were complicated with teleangiectasia, either superficial or deep-seated, or with dermoid degeneration or fibroma, or the formation of bone or cartilage or by calcification.

In Jacobi's personal cases, and those of other authors quoted by him, there was no mention of lipoma of the vulva; so that I feel justified in reporting this rather unusual case.

*Treves' Surgical Applied Anatomy*, says: "The most frequent seat of lipomata is in the region of the buttocks; the amount of adipose tissue normally present in this part renders it a favorite place for lipoma." He also gives the case of a woman who had no less than 215 fatty tumors over different parts of the body, but not one upon her face or vulva.

*E. Senak, "Du Lipome Congenital," These de Paris, 1885*, states that on the basis of his investigation, lipoma is often congenital, and that a congenital lipoma frequently appears in a simple or cystic an-

gioma, so that it must be considered as the outcome of the transformation of the angioma.

The histological examination of these tumors permits the tracing of all the stages of their development. The transformation of the angioma into a lipoma leads to the cure of the angioma.

Lipoma is often a hyperplastic tumor derived from the preexisting adipose tissue, manifesting itself as an excessive circumscribed enlargement of the fatty tissue, being on a small scale, what obesity is on a large scale. Microscopical examination shows an increase in the number and an enlargement of the volume of the anatomical elements of the adipose tissue, so that a lipoma is simply the result of hyperplasia and hypertrophy of the adipose cells. It is found especially where the adipose tissue is the most abundant, it may long remain small and stationary, or it may slightly increase during many years, and then suddenly begin to develop at a rapid rate. Sometimes the tumor resumes its original volume after a temporary increase.

The cells of a lipoma attain a much more considerable size than the cells of the adjacent adipose tissue, indicating a source of irritation which stimulates the cells to a more active development, which in itself favors an increased growth, investigating the cause of the development of congenital lipomata, on the basis of numerous observations, Lannelongue arrived at the conclusion that certain congenital lipomata do not differ from the lipomata of adults, and no plausible pathogenic explanation can be offered. In other more common cases the congenital lipoma manifests itself secondarily in a simple or cystic angioma. It must then be regarded as a natural curative process on the part of the angioma.

*Ballantyne*, in his "Ante-natal Pathology and Hygiene," makes no reference to congenital lipoma of the vulva.

*Grosch*, *Studien ueber das Lipom*. *Deutsche Zeitschrift für Chirurgie*, 1887, IX, p. 307, refers with special reference to the localization of lipomata in the various regions of the body. The author states the distribution of lipomata at the labia majora as 12 in 716 cases of solitary lipoma—a percentage of 1.67.

Seven cases of lipoma of the labia majora were reported by *Gurlt*, *Beitrage z. Chirurg., Statistik, Archiv. f. Klin. Chir.*, Vol. XXV, p. 430.

One case of lipoma of the labium majus by *Billroth*, *Chir. Klink. zu Zürich und Wien*, 1860-1876.

Three cases of lipoma of the labia, by *Wolzendorff*, *Deutsch Zeitschrift für Chirurgie*, Vol. V, p. 372.

One case of lipoma of the labium majus (*Dorpater, Chirurg. Klink.*, 1815-1885).

On the basis of his investigations, *Grosch* concludes that the localization of all lipomata is determined by the relative glandular contents of the various cutaneous regions, the predisposition for tumor formation being inversely proportionate to the glandular supply. Furthermore, he emphasizes that the localization of lipomata corresponds to the arrangement of the fat cushion in obesity.

Summarizing the factors, such as age, sex, whether congenital or acquired, and so forth, the conclusion is entirely justified that obesity and lipomatosis represent pathological phenomena which are absolutely identical in character, although perceptibly different in their mode of expression.

*Quenn*—"Lipome Congénital de la grande levre," *Bulletin de la Soc. Chir. de Paris*, Tome XVI, 1890, p. 112.

#### Presentation of specimens:

Congenital lipoma of the labium majus in a girl of five months. The growth occupied the thickness of the labium majus on the right side, and was discovered by the parents a few weeks after birth. When the child was brought for examination, at the age of two months, the swelling had the size of a small pigeon's egg. The skin at this level presented a small erectile patch. Delay was recommended, in view of the small patient's age, but in the course of the next two months the tumor grew at such a rate that operative interference was decided upon.

The operation was performed under chloroform anesthesia, and lasted twelve minutes; the hemorrhage was trifling, although several fairly large vessels had to be tied. The tumor, as presented before the society, had the size of a large fist, and measured about 12 cm. in length by 5-6 cm. in width. The sequelae of the intervention were extremely simple.

The author emphasizes the development of a lipoma side by side with an angioma; in his opinion this supports the view of Lannelongue and his school, who assume that angioma is not devoid of an influence upon the development of lipomata, at least in children.

*W. Maximow*—*Eine grosse hängende Fettgeschwulst der rechten grossen Schamlippe*, *Deutsche Med. Wochenschrift*, No. 27, 1905, p. 1074.

The patient was a young girl, nineteen years of age, who had an enormous fatty tumor, shaped like a pear, which had grown from the right labium majus and the mons veneris. The tumor was freely suspended by a pedicle, in front of the legs, hanging down below the knees. The lipoma was soft, and its skin covering was ulcerated in certain regions, due to external causes, such as friction from the clothing, contamination with urine, etc. The broad pedicle was divided, and the tumor was removed. Its weight amounted to nearly eight pounds. The operation was followed by healing by first intention.

The tumor was a genuine lipoma, with distinctly marked lobulation, which was plainly visible in cross sections.

*Wolzendorff—Ein multiples Lipom nach Typhus, Deutsche Zeitschrift für Chirurgie.* Vol. VII, 1876, p. 369.

In the case of an eight year old girl the author observed an enormous fatty tumor of the left foot, with hypertrophy of the second and third toe, so that the other toes appeared like punctiform appendages of this enormous tumor. At the same time there was also found a *lipoma of the left labium majus*.

Congenital lipoma is probably always associated with other anomalies, preferably with hypertrophies of individual parts. The seat of these lipomata, which are apt to enlarge with the growth of the body, is chiefly at the flexor surfaces of the extremities. Lipomata may originate at any place where fat is formed under physiological conditions; the most common seat is the subcutaneous connective tissue.

The development of the majority of lipomata dates back to those periods of life in which the fat cushion increases considerably, for example, during convalescence after a serious illness.

It is readily understood that lipomata may occasionally arise while there is a general increase of the body fat; but this means simply that the pathological production of fat in form of individual tumors usually occurs at a time of predisposition for the physiological formation of fat. It still remains an open question why lipomata should develop in a given case besides, or instead of, this physiological formation of fat.

Noncongenital multiple as well as solitary lipomata do not often appear before the thirtieth or fortieth year, but may develop at the age of puberty. The growth of these tumors may be gradual and progressive, so that they frequently reach considerable size with advancing years; however, multiple lipomata rarely or never

attain the extraordinary dimensions which are sometimes noted in solitary lipoma. In other cases, the tumors may appear acutely and in rapid succession, remaining stationary at a certain period of growth. Unless the tumors annoy the bearer, through their number or size, their development is apt to progress without notable disturbances.

*Berlin—Obstetrics-Gynecological Society, Meeting of January 14th, 1889. Centralblatt für Gynaekologie, Vol. XI, 1889, p. 110.*

Schülein demonstrated a lipoma the size of a small fist, which originated from the middle of the right labium majus, extending almost to the anus. The bearer was a young girl nineteen years of age, who, in her seventeenth year, noticed, for the first time, a small swelling of the right labium majus, which rapidly increased in size. At the operation the external skin incision was applied as far to the side as possible, and the tumor was then peeled from its capsule. The fairly large cavity was closed by continuous catgut sutures, covered with iodoform gauze dressings. Recovery followed by first intention.

*Stiegele—Montröse Fettgeschwulst der linken grossen Schamlippe. Zeitschrift für Chirurgie und Geburt., Vol. IX, 1856, p. 243.*

This large lipoma was attached by a broad pedicle to the left labium majus. Its length amounted to 55 cm., its width to 15 cm., its thickness to 13 cm., it weighed 10 lbs. The skin covering was retracted in certain localities, like the umbilicus. The fibres of the subcutaneous cellular tissue were widely separated by the fatty tissue; the latter was firm and solid only in the outer layers, but soft and juicy in the interior. The tumor was successfully removed by the author.

*Konrad—Fall von Lipom der Scheide. Orvosi Hetilap (Hungarian) No. 28, 1888. Centralblatt für Gynäkologie, No. 12, 1889, p. 214.*

The author reports a case of lipoma of the vagina in a woman 54 years of age. The tumor had almost the size of a child's head, and was attached by a short broad pedicle to the anterior vaginal wall, about

2-5 cm. above the urethral orifice. It was first ascertained that the bladder gave off no diverticula into the tumor, and the growth was then removed by blunt dissection, where it reached up high underneath the left descending sacral ramus, and elsewhere, with the knife, after application of an elastic ligature. The tumor was found to be a lipoma.

*Goodell, W.—Tumors of the Vulva. Lessons in Gynecology, III Ed., 1891, p. 87.*

In the case of the author's patient, the vulva was wholly concealed by a very large tumor of the left labium majus. It reached as far as her knee in the upright position. On the first examination it was supposed to be a cystic tumor, but was subsequently recognized as an *adipose tumor*. The lipoma was successfully removed by operation.

(The patient, a middle aged woman, had at the time a fibroid tumor of the uterus).

*Dresden Gynecological Society, Meeting of February 21st, 1901. Centralblatt für Gynaekologie, No. 52, 1901, p. 1426.*

*Schramm* demonstrated a pear-shaped lipoma, 8 cm. in length and 1½ cm. in thickness, which had originated by a pedicle 3 cm. in length, and as thick as a little finger, from the upper third of the right labium majus, of a girl 21 years of age. It was ablated after double ligature of the pedicle.

*Morel—Volumineux lipome de la grande levre. Bull. et Mem. de la Soc. Anat. de Paris, 1905, Vol. 80, p. 802.*

The patient was a married woman, 25 years of age, who from childhood had been the bearer of a large fatty tumor of the left labium majus. She had borne one child, and her delivery had been seriously hindered by the tumor. For the last few months the growth had begun to increase in size, and the patient applied for treatment.

On examination, the tumor was found to occupy the thickness of the left labium majus, which was everted and covered the vaginal opening. The growth was larger than a fist, soft, irreducible, sessile, not tender on pressure. It had no distinct pedicle, and seemed to have developed at the expense of the tissue of the labium majus. Its macroscopical appearance was

that of a lipoma. Its removal was accomplished without difficulty.

Microscopical examination showed a pure lipoma, without fibrous strands, and with connective tissue only around the scanty vessels. These tumors are rare, only 1.67 per cent. lipomas in 100 tumors of the vulva, according to the statistics of Grosch.

*Emmet, T. A.—Principles and Practice of Gynecology, II Ed. 1880, p. 601.*

Fibrous and fatty tumors sometimes develop in the labia to an enormous size, and, by dragging on the soft parts, they become pedunculated, or rather the tissues forming their attachment become stretched out to a broad but thin base.

About eight years ago I was consulted by a rather stout and middle aged woman, who had a growth on the left labium, which she carried in a bag attached to her waist. The tumor was of many years growth, but she could not state with any certainty the exact time. It was a pure lipoma, or fatty tumor, between six and seven inches long, oval in shape, and flattened to about four inches in thickness. The base was a broad one, but very thin, and had been so stretched that the growth reached nearly to the knees. As she lay on the back, with the knees and thighs flexed, the tumor rested between her feet.

Operative removal was refused by the patient, who would not even allow another examination, to take a sketch of the growth.

*Fritsch, H.—Neubildungen der Vulva. Die Krankheiten der Frauen, IX Ed., 1900, p. 66.*

After stating that the lipomatous new formations of the vulva may attain an enormous size, the author says that he cut off a lipoma larger than a man's head, hanging down to the knee.

*Martin, A.—Pathologie und Therapie der Frauen Krankheiten, Text-book III Ed., 1893, p. 225.*

The author mentions having repeatedly found lipomata of the labia majora, one larger than a fist.

*Balls-Headley, W.—Case of Lipoma of the Labium and Adjacent Parts. The Australian Medical Journal, August, 1888.*

The patient was a woman 51 years of age, who had a tumor of the shape and size

of a duck's egg in the left labium, in the position usually occupied by a cyst of Bartholini's gland, and of that appearance. Over it the skin was somewhat inflamed. Continuous with it, but marked by a constriction, was a tumor of the shape and size of a banana; to the left of the vagina, extending as high as the finger could reach, the os uteri being thus lifted out of reach. Similarly connected was a rounded tumor over the left ischium prominent, apparently four inches in diameter, over which numerous large veins coursed superficially.

The tumors were successfully removed by operation, and the patient made a good recovery. The labial and left vaginal tumors were smooth, without other outgrowths. That over the ischium extended very deeply, and from it sprang many smaller ovoid outgrowths (pendulous), which were similarly removed. The total weight was 2 pounds. Microscopically were seen fat cells and connective tissue.

*Emmet* records a case in which the tumor reached nearly to the knee, but the patient refused operation.

*Gordell* operated on a similar tumor, which reached as far as the knee, and *Stiegele* removed one which weighed ten pounds.

*Graefe*—*Ein Fall von Lipoma (subserosum) labii majoris. Zeitschrift für Geburtshilfe, u Gynäkol.*, Vol. XIV, 1887, p. 199.

The patient was a woman 37 years of age, who, ten years ago, first noticed an enlargement, about the size of a walnut, of the left labium majus. In the last few months the swelling had grown very rapidly, preventing the patient from working, on account of its size, and adding to her dysmenorrheal symptoms. At first the patient was still enabled to reduce in part the swelling which she believed to be a hernia. Examination showed a nodular tumor, larger than a man's head, partly elastic, partly solid, which extended upwards into the left labium majus, without forming an actual pedicle. The diagnosis lay between a new formation originating from the left labium majus and a hernia of the labium majus, with nodules of omentum in the course of lipomatous degeneration, for its contents. The operation showed that the growth was a subserous

lipoma, which had grown towards the labium majus, taking its origin from the subserous fat-tissue between the vagina and the descending ramus of the sacrum. Resection of the skin-flaps, drainage of the skin pocket. Recovery was retarded through a thrombosis of the right leg, but the patient was finally discharged in good condition.

*Bruntzel*—*Lipom der rechten grossen Schamlippe als Geburts complication. Centralblatt für Gynaekologie*, 1882, p. 626.

The author reports a lipoma of the right labium majus in a primipara 33 years of age, which interfered with child-birth. On inspection of the genitals, the right labium majus was seen to be transformed into a soft elastic painless tumor, the size of a man's fist, which entirely covered the vaginal entrance. The tumor tapered in the upward direction, and its broad lower portion was easily displaced towards the right thigh. The woman was delivered, with considerable difficulty, of a healthy child. An attempt at restitution of the tumor (which was believed to be a labial hernia) immediately after the termination of the birth, proved unsuccessful. The tumor diminished in size during the puerperium, but did not return to its original small volume, retaining the size of a fist. The patient had known of the existence of this tumor for about four years; it gradually reached the size of a hen's egg, never caused any special disturbances, and did not grow during the pregnancy. On account of the disturbances due to the presence of the tumor at this time, the patient insisted upon its operative removal. The growth was extirpated, and was found to be a lipoma of the labium majus. By means of a longitudinal incision at the level of the tumor, the very vascular growth was successfully enucleated; the superfluous segment of skin was excised, and the cavity was drained, after careful disinfection and suture. The repair process took a perfectly aseptic course, so that the sutures and drainage tube could be removed on the sixth day.

Microscopical examination showed an entirely normal behaviour of the blood-vessels in the tumor, the rapid swelling of which was merely due to the circulatory disturbances of its blood supply, as induced

by the prolonged labor. Delivery was followed by subsidence of the acute edema, and a reduction in the size of the lipoma.

Koch, L.—*Ueber eine grosse Fettgeschwulst an der Schamlippe und ihre Ausrottung, Journal der Chirurgie*, Vol. 24, 1836, p. 308. (*Gräfe-Walter*).

The patient was a woman 52 years of age, who, eleven years ago, soon after her seventh confinement, first discovered a small painless tumor at the right labium majus. Soon after the climacteric, eight years later, the tumor began to increase rapidly in size, together with fat deposits in other regions of the body. Finally, the tumor had increased so much in weight and circumference as to hang down to the knees, with a weight of at least 12 to 14 lbs. The patient decided to free herself of the incumbrance, and applied a tight ligature around the upper portion of the swelling, then she cut down upon the tumor, about the middle, where it was not particularly sensitive. With a few sweeps of her husband's shaving knife, she separated about one-half of the tumor entirely. This was followed by profuse hemorrhage from the wound surface of the remaining portion, but the bleeding was rapidly controlled by the application of cold water. The author was called in to see the patient on the next day, and, on examination, found the remnant of a tumor hanging down from the labium majus of the right side to the middle of the thighs; this mass was covered with a continuation of the outer skin, passing inwards and upwards into the mucosa of the inner side of the labium. The mass presented a large somewhat irregular wound surface, from which exuded a fatty fluid. The portion which had been cut off from the tumor corresponded with its wound surface to the portion which was still connected with the body. As a whole the tumor appeared to be pedunculated, being attached to its base to the length and width of the labium majus. Extirpation was performed by means of two crescentic incisions at the base of the tumor, separating the pedicle. Hemorrhage was inconsiderable, and the wound healed rapidly, so that the patient was able to resume her work ten days later. The right labium at this time still remained swollen and larger than that of the left side.

The weight of the two pieces together still amounted to 8½ lbs., immediately after the operation; the portion first removed had lost about half its original weight, through exudation of its fluid contents. Concerning the composition and structure of the tumor, it was found on examination, to consist of a uniform fatty mass, of solid consistence, being a lipoma in the true sense of the term.

**Conclusions.**—The interesting features of this case are, *firstly*, its location; *secondly*, the fact that it was lobulated and capsulated; and, *thirdly*, the size of the tumor and its rather slow growth until its removal.

It seems to me that there is a tendency for these tumors to grow rather rapidly, and the only rational conclusion is that, where these tumors exist, they should be removed at an early age.

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I wish to express my thanks and appreciation to Dr. Frederick Kammerer from whose service this case was submitted for publication.

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## STATE MEDICAL EXAMINING BOARDS' HALTING PROGRESS OF THE AMERICAN MEDICAL PROFESSION.

BY  
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The various state medical examination barriers that practitioners of medicine encounter when they migrate from state to state, are becoming such a nuisance that protests are arising over the entire land.

Some states accept licenses, admitting the holders free of examination, as all should do, but such instances are few and far between. New York, whose medical standard is of the highest, and could well be taken as a model throughout the width and breadth of the United States, accepts a few licenses. Standardization, a condition

desired by the best medical minds, is yet to be accomplished.

In European countries possessing standards comparable with our own, each government has the regulation of licensing physicians. An excellent system prevails, for medical schools are a part of universities, and owing to this procedure, it is impossible for charlatan medical colleges to find a foothold. Should any make the attempt, the government would interfere and promptly close it up.

In our United States, Uncle Sam assumes no responsibility whatsoever in this important matter, trusting to the states to establish all regulations. Thus far, many states have not realized their grave responsibilities, while others have stepped over the bounds of reason and enacted pernicious laws. There are forty-nine states, with forty-nine divergent medical practice acts, in the hands of sixty-two different boards—sometimes two or three boards to one state. That matters may be even more complicated there has recently appeared a school called osteopaths, having licensing boards in seventeen states. The osteopathic boards no doubt protect their men as they see fit, viz.: to use surgery and exhibit drugs.

These laws put the medical profession in an absurd position, intolerant to common sense. The ridiculous picture of sixty-two different boards, lacking any legal cohesiveness and each one declaring to the migrating practitioner licensed in his state: "You shan't play in my back yard unless you get my license by examination!" is opposed to all sense of right or justice.

For example, the State of Connecticut, western and southern borders, are bounded by the great Empire State. Some of New York's most distinguished practitioners

have their summer homes in Connecticut. As soon as these gentlemen cross the invisible state line and attempt to practice their profession without a Connecticut license, *obtained only by examination*, they violate the law and render themselves liable to fine and imprisonment.

No practicing physician of high standing, after years of practice, has the time, let alone inclination, to restudy the rudiments of his profession sufficiently to pass a state board examination.

Incongruous as it may seem, medical men have submitted to these state board satraps, till their present methods are so objectionable as to cause Dr. Colwell of Chicago to declare in the *Journal of the American Medical Association* what the state boards should do. He says there should be:

1. A moral force standing above the individual boards, supporting the good work being done, and extending knowledge of proven methods to other boards.
2. An influence toward a rapid extension of reciprocity in medical licensing.
3. An organization which will influence the general adoption of a single and fair educational standard for measuring all candidates for the license to practice the healing art, by whatever form of treatment.
4. An organization which will be in position to solve the problem by providing a single examination which will be so thorough as to command recognition by all state boards, along the lines of the Conjoint Board of England or the new Dominion examination just provided in Canada.

A step in this direction is the introduction of a bill by the Hon. T. L. Reilly, member from Connecticut, to create a United States Medical Licensing Board.

The bill may be unconstitutional, but if it is, then it is high time to make an amendment to the Constitution to promote the interests of the most self-sacrificing profession in the country, viz.: the profession of medicine and surgery.

No doubt the present state boards will roar loud and long against this measure, for many men will be out of their jobs, but some of these disgruntled gentlemen should heed the words of the great American surgeon, Samuel D. Gross, when he tells us all that in defining a true physician: "Unless honest in his purpose, scrupulously determined in every case to act only with an eye single to the benefit of his patient and the glory of his profession, he is not worthy of the name he bears or fit for the discharge of the solemn duties which he assumes. \* \* \* Self should not have the slightest weight in the matter."

That there is unrest and disorganization in the profession of medicine, all far-seeing doctors are forced to admit—more so today than ever before in the history of medicine in America. This unrest is largely due to the state medical examining boards that are forcing licensed M. D.'s who are unsuited to one locality, either in temperament or by accident, to remain in that community. From the earliest times, physicians have moved from one locality to another, and usually to the benefit of the communities wherein they sought new fields of endeavor.

Andreas Vesalius, the great anatomist, born in Brussels in 1514, studied at Louvain, then at Paris, and at twenty-one became professor of anatomy at Padua; later he was summoned by the Emperor Charles V to the Court of Madrid. Then Gabriel Fallopius, 1525, at varying periods practiced and taught at Ferrara, Pisa and

Padua. Ambroise Paré, the first illustrious military surgeon, born at Lavel, 1510, studied at Hotel Dieu at Paris and at one time practiced in various continental states in and out of the service. Albrecht van Haller, born at Berne, 1708, studied at Bienne, Tubingen, London, Paris and Basle and taught in Berne, where his own townspeople treated him so atrociously, even at the time that his books on Anatomy, Physiology and Botany were honored all over the world, that he left them, boiling with righteous wrath, to become professor of anatomy at the University of Gottingen.

Our own great American surgeon, Samuel D. Gross, began in Philadelphia, then went to Cincinnati, Louisville and New York and was called back to Philadelphia to be professor of surgery at Jefferson, a chair he held with eminent distinction for twenty-six years.

Austin Flint (1812 to 1886), no doubt one of the foremost physicians America has ever produced, made his reputation in Buffalo and later came to New York.

Nicholas Senn, the modern genius of surgery, began in Wisconsin, and later influenced the surgery of the whole world by his originality after going to Chicago.

This migratory phase of the physician's nature could find an outlet 35 years ago, when his diploma permitted him to seek his Eldorado without hindrance, but today, no. There is no denying the fact that we had geniuses in the 70's and 80's, greater men individually than at present. No doubt in small towns throughout the Union are men who, if permitted to move about, could become as great as the greatest, with the stupendous advantages that are being daily revealed by science, but what keeps these men of talent in the shadow is that political bogey, the state medical examining board.

Advocates of state examinations will say to this—if this man is so good, why does he not brush up his knowledge and tackle the question?

For just this reason. The subject of medicine and surgery today is so vast no one mind can compass it all. The man of genius in the small town has no doubt spent years of study upon general surgery, let us say. He has endeavored to keep up to the times. His reading has been extensive. The preliminary subjects, however, are forgotten. He knows nothing of modern inorganic chemistry or histology. He knows his anatomy as a surgeon, where things ought to be, how they should look, but not as a medical student, fresh from his quiz master, who can tell you the origin and insertion of every muscle in the body, how many lines long and heavy are the organs, and a lot more stuff that is called learning of the subject, but not knowledge. Knowledge of surgery is gained by years of feeling, sight and hearing of this and that, much that cannot be taught didactically and much that can only be learned by personal experience.

So, should this doctor determine to re-study his profession for a state board, he finds quiz books, filled with thousands of questions. He ascertains that it becomes a matter of six months' mental work. His practice suffers. His patients seek another man less taken up with his books. He goes up before the board, makes 70% instead of 75%; in his surgery, he makes 100% and over; in his rudimentary branches, 40% to 30%. He has failed to pass. The young boy at his side, fresh from a big New York quiz master, goes through at 90% in all. The man of knowledge fails. The trained tyro wins. The elder surgeon returns to his hamlet, a heart-broken man.

He has suffered more than a financial loss. A lot of political M. D.'s, who no doubt could not answer the questions they ask, say that he is no good, insinuating incompetence. He re-starts among his old patients, and may make a big discovery. His name is known in all medical centers the world over. He is a great man under a bushel. His methods of operating are used by some of the very men who flunked him. And what do these vipers say when his talents are lauded to them? "Well, he could not pass our state board."

It has been well said by the ancients: "In the presence of stupidity, the gods are dumb." But the profession is awakening to the fact that the manacles must be broken and a conjoint board, universal reciprocity, or a United States License Act are on the way. The days of the license satrap are numbered.

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## THE USE AND ABUSE OF NORMAL SALT SOLUTION.

BY

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The term "normal salt solution" is derived from the fact that the blood in its normal state contains a certain amount of sodium, calcium and potassium chlorid. These with other constituents of the blood give it a specific gravity of 1052-1057.

When distilled water contains 0.65% of sodium chlorid, it contains that amount which is normally found in the blood.

A closely approximating solution is one with 50 grains of sodium chlorid, 20 grains

of calcium chlorid and 20 grains potassium chlorid to each pint of water. This gives a reading of 1009 specific gravity by hydrometer test.

In an emergency where only sodium chlorid is available, where a hydrometer can not be had, then it should be borne in mind that a teaspoonful of common table salt to each pint of, at least, boiled water will make the best solution under the circumstances.

A solution of this kind approaches the normal blood serum and under suitable circumstances will perform the physiological functions of the same.

As a general proposition it may be briefly stated that whenever the blood for any reason seems insufficient in bulk, then the administration by hypodermoclysis of the normal salt solution is indicated.

After surgical operations or injuries received where a large amount of blood has been lost, nothing will act so promptly and surely as the intravenous method of increasing the bulk of the circulating medium.

The normal salt solution should be injected through the needle of a hypodermic syringe directly into a vein.

According to Dawbarn, a temperature of 110 F. gives immediate results.

It is hardly necessary to call attention to the proper introduction of the needle into the vein, the necessity of an absolute aseptic condition of all things used, and the certainty that no air bubbles enter the vein.

**Uses.** In shock, following operations with loss of a large amount of blood, a sudden restoration of the volume of blood will act as a tonic to the heart and blood vessels, increasing their propulsive power by inducing a more vigorous contraction of the larger blood vessels and thus assisting

the *vis a tergo* to again send the blood through the capillaries.

In exhausting diseases, such as cholera, dysentery and gastroenteritis accompanied by large watery movements, hypodermoclysis has been practiced with excellent results.

The hypodermic needle or small cannula is introduced into the areolar tissue of the abdominal wall, the normal salt solution is allowed to flow into the tissues from a fountain syringe or a similar container. From one pint to two quarts may be used at one time.

In a severe toxemia, especially of the uterine region, following incomplete abortions or in general uremic states prior to and after delivery, the use of a normal salt solution is frequently of the utmost importance.

In toxemia from other conditions or where the stomach can not or will not make use of water, such as immediately after gastric operations or during unconsciousness, normal saline solution may be introduced into the system by allowing it to be absorbed from the mucous membrane of the lower bowel. This manner of using water is enteroclysis or retention enema.

A soft rubber catheter is introduced into the rectum in such a manner that it will not coil upon itself. The water must flow drop by drop according to the Murphy method. Several pints of water are thus absorbed during twenty-four hours without disturbing the patient and without the water having passed through the gastrointestinal tract.

In all these conditions the pulse is the proper guide as to the efficiency and quantity used.

**Action.** Saline solution prevents the thickening of the blood-plasma, not so

much through the addition of the water as the presence of the sodium chlorid, the function of which is to keep the fibrin-forming elements and the albumin of the blood in a fluid state.

During acute or high fevers or inflammations, sodium chlorid being thus needed, it accumulates at the seat of morbid action, disappearing temporarily from the urine. Its reappearance therein is consequently one of the surest signs of the patient's improvement.

From the foregoing it is self-evident that the use of saline solutions either intravenously, hypodermatically or by the intestinal tract produces certain changes in blood-plasma that have been abundantly demonstrated by clinical experience. Valuable, however, as the therapeutic use of the normal salt solution is, there is no lack of evidence that this agent has not only been productive of great harm, but has even been the direct cause of death.

**Dangers.** It would be strange if a remedy as potent and yet as simple as the normal salt solution should escape indiscriminate and thoughtless use by the inexperienced.

Again and again attention must be called to the fact that we are dealing entirely with physiological processes.

That the elimination of water by the kidneys is so frequently looked upon as practically without limitation, together with the fact that sodium chlorid is found so generally in the fluids of our body and is used *ad libitum* with our daily meals, no doubt account for a great deal of its indiscriminate use.

Then again the error is often made of prescribing the use of this agent without a knowledge of the blood-pressure, the cardiac condition, the ability of the vessels

to handle such a sudden increase in the circulating medium or finally the condition of the glomeruli on which depends so much of the capacity of the kidney to excrete the increased amount of chlorid thus suddenly forced upon it.

Therefore when use is made of normal salt solution in the presence of some grave and serious condition to the system and as a result of which the patient expires, the blame is seldom or never laid to the door of this therapeutic procedure, but rather to the grave and serious pathological changes which previously existed.

Under this explanation the misapplication of so valuable an agent escapes the severe condemnation it justly deserves. Worst of all, however, the physician does not profit by his mistake and use this useful remedy more carefully, but allows his interest in its real virtues and utility to lag.

The abuse of the normal salt solution is well set forth in a collection of cases by Evans.

A case was recently reported by Brooks where one and one-half litres of salt solution in three doses were introduced per rectum, apparently without any particular indication for its use. A short and simple appendectomy had been performed, patient had practically lost no blood, the pulse was perfect. The giving of the normal saline solution was left to the nurse, who either through ignorance or gross carelessness made use of a stock solution of nearly saturated sodium chlorid.

This patient received almost nine ounces of pure salt, with rapidly fatal results from acute sodium chlorid poisoning. Such cases are probably rare, but it is well to bear this one in mind when hurriedly and extemporaneously preparing the solution.

It was for just such an emergency that I have tried to emphasize the necessity of trusting to nothing else except the hydrometer test whenever possible.

When a teaspoonful of salt is used to the pint of water we do not of course see such acute poisoning, but we must bear in mind the hemolytic effect of solutions that are hypotonic.

It is the underestimating of such effects that swell our statistics of fatalities from shock, hemorrhage and other surgical complications.

In surgical shock after even a prolonged operation without hemorrhage we may have a low blood pressure, but this low blood pressure is certainly not an indication for a normal salt solution.

The blood pressure under such circumstances is low as the result of vasomotor paralysis causing peripheral dilatation.

How is the addition of a salt solution to a system that is incapable of handling the fluids already present in the vessels at that time going to benefit it?

On the contrary, while the addition of the salt solution can not benefit such a condition, it is capable of doing great harm.

The following case is interesting:—A woman aged 28 was operated upon by the Wertheim method, for the removal of a carcinomatous uterus. After the operation, normal saline solution was ordered to be administered by the Murphy method of proctoclysis. Again a nurse as a result of carelessness administered five quarts of saline solution within the period of eight hours. The kidneys failed to act, while the patient's pulse rose to 148 per minute. It became irregular and weak, patient looked very badly and went into a stupor. Under the influence of stimulants and mustard to the precordia, the alarming symptoms subsided, the pulse dropping in two hours to 118 per minute. In this case the solution was of the proper kind; yet the kidneys failed to eliminate the added amount of chlorine. Poisoning under such conditions

is sure to occur, especially when the large amount of increase in the circulating fluid embarrasses the cardiac action.

Of all the metallic chlorides, sodium chloride is the least harmful, still Joseph and Meltzer found that 3.70 grams (50 grs.) per kilo. (100w) of body weight produced death in healthy dogs.

Irregardless of toxicity of the salt, no solution should be introduced hypodermatically, intravenously, or by absorption from the mucous membrane without thorough interrogation to ascertain the functional capacity of the kidney to excrete both the salt and the fluid.

Where the eliminating function is at all impaired so that the excess of sodium chloride is not promptly eliminated, osmotic disturbances are sure to follow with resulting harm to the tissues. Just imagine a toxemia due to renal insufficiency, how and by what process can a saline solution be recommended as an effective diuretic? It is nevertheless a very common thing to see the virtues of a saline solution extolled as a diuretic in just such cases.

That the elimination of toxines through the production of diuresis can be brought about is true only to the extent to which the kidney is functioning.

A case reported by Sippel illustrates this:—A patient suffering from eclamptic convulsions, which had kept up for thirty hours after delivery, was relieved following the decapsulation of one kidney. Copious urination followed, coma completely subsided. Following this three quarts of physiological salt solution were given hypodermically with the result that a complete anuria and coma returned, which soon proved fatal.

It has been previously stated that a normal saline solution is of marked benefit in toxemias, especially when of uterine origin, followed by septicemia.

In such cases it is always assumed that the skin and the kidneys are functioning normally.

A warning must be given not to confound such a toxemia with one where the sodium chlorid elimination has been interfered with as in the acute fevers.

In lobar pneumonia, especially in the later stages where the salt is retained more or less at the site of the lesion, where the kidney function is unimpaired excepting as far as the excretion of sodium chlorid is concerned, every precaution must be used lest too great a quantity of salt is retained within the body, especially the lungs, and lead to sudden edema in that region.

The harm resulting from the large amount of water introduced is probably even greater than that produced by the effects of chlorid retention.

The value of the restriction of fluids in conditions of cardiac insufficiency has been almost universally accepted, especially when this is associated with hypertension of blood pressure.

Even with prompt excretion by the kidneys, skin and lungs, the task imposed upon the heart is greater in direct proportion to the amount of fluid introduced, and this regardless of the manner of introduction.

There is no doubt that functionally competent hearts and kidneys are capable of successfully handling much therapeutic imposition. But from personal observation I am convinced that this procedure is too often made use of without first having ascertained either the functional capability of the heart or the kidney.

Normal saline solution has a wide range of therapeutic possibilities if there are present qualitative or quantitative changes in the blood-plasma which present logical

indications for its use. In other words, we must always bear in mind the reaction of living cells to the therapeutic agent we wish to employ.

231 W. 96St.

### GRAHAM STEELE MURMUR.

BY

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The murmur caused by a relative pulmonary insufficiency or Graham Steele murmur, is due to a dilatation or stretching of the pulmonary orifice as a result of an abnormally high blood pressure within the pulmonary circulation. Anything that will obstruct the free flow of blood within the pulmonary circulation will cause an intrapulmonary hypertension, raising the blood pressure within the pulmonary artery and the right ventricle. If this condition is long continued it will lead to hypertrophy and dilatation of the right ventricle with the consequent widening of the pulmonary ring and inability of the valves to completely close up the orifice during cardiac diastole.

The common underlying causes of pulmonary obstruction are mitral diseases, especially mitral stenosis which causes congestion in the pulmonary circulation, also chronic pulmonary indurations as emphysema, pulmonary cirrhosis, and general pleuritic adhesions.

Though a relative pulmonary insufficiency is an uncommon condition, it is of considerable importance in the proper diagnosis of some of the heart and lung diseases. The presence of a Graham Steele murmur with indefinite physical signs of mitral disease will point in favor of a diag-

nosis of mitral stenosis because it is the most frequent primary lesion in association with this murmur. When the mitral valve is intact and the left side of the heart is in good condition, the presence of this murmur will aid in the diagnosis of some chronic pulmonary disease. Conversely, when there is a mitral stenosis or a chronic pulmonary induration with a diastolic murmur at the base of the heart and a right ventricular enlargement, it will be in favor of a relative pulmonary insufficiency and not of an aortic insufficiency.

The murmur of a relative pulmonary insufficiency, or the murmur of high pressure in the pulmonary artery, is a soft diastolic murmur heard best in the pulmonary area and in the third left intercostal space near the border of the sternum and thence is propagated down the sternum. The second pulmonic sound is weakened or obliterated. According to the pressure variations in the pulmonary artery, the murmur will vary in intensity or it may appear and disappear.

The differential diagnosis between a pulmonary insufficiency and an aortic insufficiency is not difficult. In a relative pulmonary insufficiency there is always present an aortic stenosis or a chronic pulmonary disease. It is associated with a right ventricular enlargement, feeble pulmonary second sound, clear aortic second sound, and a small quiet pulse. While in an aortic insufficiency, though the murmur may be heard with great intensity in the pulmonic area, there is the large left ventricle, the throbbing arteries, the Corrigan pulse, an obscure aortic and a clear pulmonic second sound. To the pulmonary insufficiency may ultimately be added a secondary tricuspid leakage and general venous engorgement. An organic pulmonary insufficiency in consequence of structural deformities of the

valves is a very rare lesion. Exceptionally relative pulmonary insufficiency follows a purely functional rise of intrapulmonic blood pressure.

225 Henry St.

#### SURGICAL NOTES.

The ligature method is to be used on those hemorrhoids which have a pedicle and are readily accessible.

Use the cautery to open a tubercular fistula. If a knife is used it means opening up the lymph channels and the possible entry of tubercle bacilli into the blood stream from the fistulous tract.

Prolapse of the rectum is not uncommon in children. Searing the prolapsed mucous membrane with the cautery, followed by reduction, is a simple and efficient procedure and frequently results in a permanent cure.

The ideal treatment of hemorrhoids is extirpation with clamp and cautery. Give the patient a cathartic two days before operation and keep him on a light diet. The night before and the morning of the operation, give 2 per cent. hydrogen peroxide enemas. Use a general anesthetic if possible. The clamp and cautery can be employed with local anesthesia, but this is not advisable. Insert the rectal tube. The second night after operation inject olive oil through the rectal tube and give the patient a dose of castor oil. The following morning the tube comes away. Follow the bowel movement with 2 per cent. hydrogen peroxide irrigation.—Wagner in *International Journal of Surgery*.

When removing a dermoid cyst at the root of the nose don't forget that it may lead through the bone sutures to the meninges. Especially if the cyst or sinus is infected it is not wise to dissect it out too deeply unless persistent discharge after removal of the presenting portion cannot be cured by cauterization, etc.—*Am. Jour. of Surgery*.  
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# THE ANNOTATOR



**The Causes of Weak-Foot.**<sup>1</sup>—Dr. Emil S. Geiss of Minneapolis in the course of an article on Weak-Foot and similar conditions, mentions the following causes:

*"First.* Ill-fitting shoes. Owing to the fact that the toes are cramped or the foot too tightly constricted, it is easily seen that normal muscular action is materially inter-

fered with. Atrophy of the muscles from disuse follows as a natural consequence. High-heeled shoes, worn for long periods will in many cases cause a secondary contracture of the tendo Achilles. When the wearer goes back to shoes with a low heel, or no heel (such as tennis shoes), he—or she—develops symptoms of foot-strain. Every summer brings a small epidemic of sufferers to the orthopedist due to abruptly quitting of high-heeled shoes in favor of tennis shoes. The role of the shortened tendo Achilles in the etiology of weak-foot, was demonstrated twenty years ago by Schaffer of New York; it was, however, almost forgotten until brought to the foreground recently by the writer, when at the Minneapolis meeting of the American Medical Association, many orthopedists concurred that this was a frequent and important cause for beginning weak-foot.

*Second.* Corns, callosities and ingrowing toe-nails play an important part in the etiology of weak-foot. The patient "favors the foot"; walks with the foot in more or less of an unnatural position; strains it and develops symptoms of weak-foot. I should like to emphasize here that proper attention to these seemingly insignificant corns, etc., is of great importance if we would permanently relieve the patient.

*Third.* Combined with the above, we must consider prolonged standing and walking on hard stone and tile walks and floors as being responsible for many cases of weak-foot.

*Fourth.* Illness, either long continued or of short duration, as also some indoor occupations, will frequently weaken the muscular system sufficiently that when insults, such as badly fitting shoes, or walking on hard, non-yielding surfaces, are added, symptoms of foot-strain will appear.

*Fifth.* Lack of the proper exercise, walking, is a frequent cause of beginning weak-foot. The automobile is responsible for many cases on account of the disuse of the foot. The writer has also seen several cases where the condition of foot-strain was due to long-continued, faulty manipulation of the pedals of the auto.

*Sixth.* Deformities of the toes, such as hallus valgus, hammer toe, etc., are frequently the cause of more widely-extended foot symptoms, and the primary trouble must be corrected before we can expect permanency of results from treatment.

**The American Mine Safety Association.**<sup>1</sup>—The American Red Cross Society has endeavored to secure the cooperation



of miners in plans for their safety and well-being by forming First Aid Corps throughout the mines of the country. The first annual meeting of the American Mine Safety Association was held in Pittsburg in September. A Mine Reserve Corps is to be organized to give instruction in the use of safety and electric hand lamps, pulmotors

<sup>1</sup>St. Paul Med. Jour., Dec., 1913.

American Journal of Surgery, October, 1913.

and other important apparatus. Its work is also to recommend the establishment of proper safeguards against accident and the approval of safety inspection.

The importance of this work is urgent for the mortality of the mining industry of this country is many times greater than in foreign countries. Thus in the United States, 2,719 were killed in coal mines in 1911, 9,106 were seriously and 22,228 slightly injured, these numbers being duplicated in metal mines and quarries. Much of the wealth, comfort, and health of the nation depends upon the coal, iron, and precious metals obtained from within the earth and it is only right and fair that those who do this essential work be safeguarded in every way.

**Animate Germ Carriers.**<sup>1</sup>—Dr. Brady affirms that the trend or sanitary progress is opposed to the idea that germs

travel through the air, that the present status of sanitary practice makes animate germ carriers the cause of almost all germ transmissions and that pathogenic germs may live in the carrier's body without the development of disease.

In surgical practice the aim is to eliminate germs from the operating room and the surgeon's hands and instruments and not to kill them after they have infected the wound.

Surgical asepsis is a synonym for absolute cleanliness and this is now coming into use in medical practice also, as medical asepsis. This is illustrated in the sanitarium care of consumptives, where tuberculosis is less likely to be acquired than in the average home.

Since experience teaches that the air and furniture in the room of a diphtheria or scarlet fever patient who is well cared for is not germ laden, terminal fumigation or disinfection becomes a mere fetish.

The contagiousness of consumption is at present exaggerated, to the detriment of progress in the campaign against the disease for only the careless consumptive is dangerous to live with. In Providence, fumigation after diphtheria and scarlet



fever has not been practiced since 1905 and there has been only one slight epidemic of each since that time. No chemical anti-septics for the hands are used in the Providence hospitals, but the hands of nurses and attendants are washed with running water almost as often as anything is touched. In the reception ward doubtful cases of infectious disease remain until a diagnosis is clear, but instances of cross-infection rarely occur. Smallpox alone is now believed, *not known*, to be spread through the medium of the air.

Pathology has determined that animate beings convey the germs of disease and practically all the great advances in sanitation and hygiene are based upon this fact. Rational medical asepsis is the logical means for the limitation of the spread of all contagions.

Instruction of the people as to the modes of distribution of disease germs is the greatest weapon at our command.

To kill the typhoid fly and allow the typhoid Mary to roam at will is not logic nor common sense.

This is all very interesting but until the public at large is as well educated as in Providence sound judgment will hardly allow disinfection to be discarded completely. Common sense and discrimination should prevail and as long as the question is an open one, disinfection must be employed consistently as an essential link in the chain of modern sanitation.

**The Value of Sanitation as Applied to Railway and Other Corporations.**<sup>1</sup>—M. C. Thrush thinks the following rules are applicable to all large railway corporations:



1. All railway corporations should have a department of health and sanitation which should direct and control all matters relating to the medical welfare, both of its employees and the public.

2. An expert sanitarian who is a doctor of medicine should have charge of this department and he should have such a suitable title as director of health and sanitation.

He should have the same authority in his department as the general manager has in the operating department of the road.

3. He should work in direct conjunction with the general manager, both being under the supervision of the president of the road.

4. There should be twelve department superintendents, each of whom should have direct supervision of a particular department, all being controlled and managed by the medical director.

5. The director's office should be located at the general headquarters of the company.

6. This plan would result in consolidating and systematizing the various medical departments of the road under one directing head, which would mean more efficient service with less expenditure of capital and a condition of greater safety and protection to the traveling public which pays for and should receive safe transportation under sanitary regulations.

**Another Blot on Russia.**—Russian medical experts at the Beiliss trial in Kieff, have caused an outburst of indignation throughout the civilized world. The original murder charges against the poor man were atrocious enough to have aroused all Christendom in protest, but the attempt to bolster them up by biased medical testimony has given physicians a feeling of personal degradation. Expert opinions are supposed to be strictly scientific and the same in all countries, but one Russian doctor—let us forget his name—has given the impression that racial or religious bias may be strong enough to make an expert see things which have no existence at all. On this side of the Atlantic, the Almighty Dollar can make some of us see health in the insane and insanity in the sane, if it will help the man escape punishment; but no one has ever dared to permit religious prejudice to sway professional opinion for the purpose of convicting the innocent.

So it is difficult, in an atmosphere of perfect religious toleration, to appreciate the psychic effect of religious feeling so strong that it will induce men to murder heretics in the name of Christ or Allah. Such creatures may be thoroughly convinced that



ritual murders occur, but there is no reasonable explanation for the way a few of the officials have failed to combat the delusion but have even fostered it and persecuted those who tried to bring out the real facts. They have injured their country's reputation more than they realize. Of course Beiliss is not the only victim of persecution in the history of the world but he has received more attention—and the comments of the world's press have unquestionably had much to do with causing his acquittal. Nations are sensitive to criticism nowadays, for they depend upon outside help in many things and cannot get it if foreign public opinion is against them.

The causes of anti-semitism ought to be scientifically investigated for we are quite sure that their intelligent consideration will not only go far to end persecution but will prevent the growth of a similar prejudice in America. There are two sides to every question and we have never met a Hebrew who claimed that he or his people live more immaculate lives than the rest of us. Russians have stated that the Jews do not perform a fair share of national defense, yet by common report the Manchurian army was full of Jews in the Japanese war, and practically all the medical service was rendered by brave and patriotic Jews whose deaths by bullets and disease were as great as in any other branch of the service. Of course shortness of stature and physical weakness prevent many of them from shouldering a gun, but they can be used in other ways. They seem to be looked upon as intruders who do not assimilate and become a part of the body politic, holding themselves aloof from national life. The feeling against them has therefore been explained as purely economic, the religious prejudice being merely an excuse. Whatever the cause, America has been placed in a most distressing position, for its sympathies always go out to the oppressed, and yet Russia has been our staunch and steadfast friend for over a century and has prevented European coalitions which would have destroyed the American commonwealth on more than one occasion. The Jewish question has seriously disturbed that cordial international friendship which may some day be as essential for our existence as it was during the civil war. Our welfare demands an early settlement and it certainly behooves the

American Jews to find out the reasons for a foreign persecution which sooner or later is bound to involve their new country to whose prosperity they are contributing so enormously in manufactures, commerce, science, art and medicine. Their absence from agriculture does not produce the prejudice here or in England that it does in the agricultural parts of Europe. The whole question is one which must be investigated as a possible cause for the Russian situation. The Hebrew element is too valuable an asset—economically, morally and socially—to this and every other commonwealth for any harm to be permitted to the race, even if the dictates of humanity did not lead every decent man to offer strenuous protest against the perpetration of further outrages on a people who ask nothing beyond the right to live in peace under the laws of their chosen countries.

**Old War Ships as Sanatoria.**<sup>1</sup>—It is proposed to make use of discarded battle ships as sanatoria or preventoria for

those who are suffering with or are threatened by tuberculosis, with particular reference to children. The proposal is a good one and many tuberculous children might be cured by such treatment.

The French have had sea-coast hospitals for several decades for the treatment of tuberculosis and rachitis in children, and they thus acquire health and the prospect of useful lives instead of early death or a future as weaklings, cripples, or hunchbacks. Many worthy and useful citizens are thus obtained to strengthen the state. The Sea Breeze Hospital, near New York, was suggested by and modeled after the French maritime hospitals for tuberculous children.

The importance of such measures can be appreciated by recalling the statement made at the recent Congress for School Hygiene at Buffalo that nearly one million tuberculous children are attending school in the United States and that school instruction in the open air is provided for not more than fifteen hundred.

<sup>1</sup>New York Medical Journal, September 13, 1913.



These facts are appalling, but why should they be? The concentration of myriads of people in cities, the huddling of hundreds in illy furnished, illy appointed, badly ventilated tenement houses can have but one logical result—disease and early death, mostly from tuberculosis.

When Indians and negroes live in stuffy houses instead of out-of-doors they get tuberculosis; it is simply cause and effect.

But it is a fine thought that ships which were designed as weapons of war, and principally for destructive purposes should finally be devoted to service as homes and hospitals for the sick, and particularly for children. Would that all war-ships everywhere might be devoted to similar purposes.

**The Anti-Vivisectionists.**—The anti-vivisectionists have had their annual orgie of hysteria, mendacity and criminal libel. This year they have distinguished themselves by repeating old stories which have been proved false over and over again. It seems that they have acquired "fixed ideas" which could be classed as delusions of the insane since the sufferers are not convinced of their error by presentation of the facts. This is possibly the most charitable view to take of people whose whole life is dominated by a pathological zoophilia. There is some danger that they might influence a gullible legislature to pass laws interfering with the research which is saving mankind from so many of its fatal ills. It is shocking to read the false statements in a recent article by a prominent New York clergyman, for the unthinking take his statements as true. Public health therefore demands that we devise some way of ending this danger without interfering with free speech. It is at least high time that the libeled investigators bring criminal charges against their traducers and civil suits for appropriate damages. Surely we can trust judges and juries to give such matters serious consideration as in England. We are afraid that our habit of reckless political statement has created a public opinion that libel is a trivial matter, but courts can lead the way to teaching the public better habits. A few imprisonments would surely exert a deterrent effect on speakers and sober the craziest of them. So let us "get the law on them."



### The Head Doctor of the Town.

To the Editor

AMERICAN MEDICINE, New York:

Several days ago a letter was received by the postmaster of my town addressed in the lower corner of the envelope as follows:

"Please hand to the head doctor of your town."

The postmaster, being a man of extraordinary intelligence, placed the letter in the box of the doctor who receives AMERICAN MEDICINE. It seems the writer of the letter had a daughter afflicted with hypertrophied tonsils and adenoid growths and possibly concluded that he ought to consult a "head" doctor. But whether he meant the *leading* doctor or the *doctor of the head*, the postmaster who received it knew that AMERICAN MEDICINE helped doctors to get ahead, and therefore turned the letter over to the reader of this publication.

A READER.

### The Ship Surgeon.

To the Editor

AMERICAN MEDICINE, New York:

I note in the November number of AMERICAN MEDICINE your editorial on the increasing responsibilities of the ship's doctor. You state that as far as you know these physicians have contributed comparatively nothing towards the advancement of their science.

I wish to state that I was ship surgeon in 1898 on the Holland-American line running between New York and Rotterdam. My service extended over the short period of about six months. And, as you state in your editorial, the remuneration was too small to permit me to continue the work. During those few months however I did contribute something of my experience on ship-board to medical literature. I cannot now cite the exact issues of the journals in which these articles appeared. I will state, however, that in the *Medical Record* (New York) probably in August, 1898, there appeared a communication written by me entitled "A Safe and Simple Method of Vaccinating." Somewhat later in the same journal there was another communication from me entitled "Some Observations of a Ship Surgeon." Written at the same time and appearing in the *Canadian Journal of Medicine and Surgery*, sometime in 1902, there was also a bit of poetry in lighter vein. This last was a mild remonstrance against the type

of immigrants then being admitted into this country.

I admit that these efforts contributed comparatively nothing towards the advancement of medical science; although I was informed by a U. S. Army surgeon in the Phillipine Islands some years later that my article on vaccination had practically revolutionized the method of vaccinating in the United States Army in many localities.

I am simply giving these instances to you to show that even fifteen years ago there was at least one ship surgeon who did utilize some of his leisure time and opportunities in an effort to contribute something, even though small, to the advancement of medical science.

Very truly yours,

V. A. CHAPMAN.

### More on Food Preservatives.

To the Editor

AMERICAN MEDICINE, New York:

I was much interested in reading in your October issue, the editorial comment on "Food Adulteration." I thoroughly agree with your statement—"Let us then wage a crusade for correct labels and urge heavy penalties for selling anything under false pretences."

Truthful labels are certainly very important, in order that the consumer may know what he is purchasing. According to law, if a manufacturer uses one-tenth of one per cent of benzoate of soda, he must make this statement on his label; whereas a manufacturer who uses vinegar, which contains 4 per cent of acetic acid, can percolate vinegar through spices, thus obtaining a still more powerful preservative, and state on his label that no chemicals are used in the preparation of the food.

Are you aware of any experiments ever having been conducted to determine the effect on the human system of salt, sugar, mustard, vinegar, spices, creosote, etc.? If these spices were put in capsules and fed to members of an experimental squad, for seven months, as was done with borax and boric acid, do you suppose that the men would appear to be and declare themselves to be in better physical condition than they were when the experiment commenced? They did this, however, after seven months' siege of boric acid and borax in capsules.

You say in part: "Some of us may have idiosyncrasies by which we are poisoned by some of the chemical preservatives so com-

monly used." The only commonly used preservatives that I know of are those permitted by law. Borax and boric acid are permitted in England and Australia, but not in the United States.

You also say "No one likes to buy foods which are so dirty and infected that they will not keep without strong antiseptics." One would be led to suppose from the above quotation that the only use for any food preservative would be to enable manufacturers to use dirty infected food.

A manufacturer wrote the President of the United States a couple of years ago, saying that the only reason manufacturers desired to use benzoate of soda was to enable them to shovel up the floor, rotten, dirty, putrid skins and cores, and utilize same. It seems to me, however, that one with any intelligence whatsoever should wonder if any odorless, tasteless substance could mask such inferiority.

Mortality statistics show us that the death rate from the circulatory system and genito-urinary system is increasing very materially annually.

According to the 1910 report of the Field Secretary of the Provident Life Assurance Society of England, the death rate from diseases of the heart, kidneys and circulatory system, including apoplexy, has increased 105 per cent in the United States since 1880, while in England the increase in deaths from these diseases during this period, was only 3 per cent.

England demands her meats, fish, etc., lightly salted, preserved with borax, and her butter lightly salted, preserved with boric acid, while the daily consumption of salt in the United States is estimated at 300 grains per day; only fifteen grains being utilized by the system. This leaves in the system 285 grains of a mineral substance, the excretion of which undoubtedly has some effect on the kidneys. We know the effect of salt on iron, leather, and we know that when it is used on meat, it withdraws the meat juices and hardens the muscle fibres. We also know that salt is dehydrating. Is it not reasonable to suppose, therefore, that the excessive consumption of salt by the average American has a tendency to increase the death rate from kidney diseases and those of the circulatory system?

The medical fraternity is evidently fast learning the beneficial effect of a salt free diet, and it has been demonstrated scientifically that a salt free diet is beneficial in epilepsy, uremia, dyspepsia, eczema, edema with Bright's disease, nephritis, cardiac and pulmonary edema. If it is necessary to exclude salt from the diet of those suffering from the above mentioned diseases, is it not reasonable to suppose that if the consumption of salt were materially decreased, there would naturally be a decrease in such diseases?

The preservation of food is a proposition of grave importance and the ancient preservatives which are used without any restriction, may be responsible for the increased death rate from the circulatory and genito-urinary organs. Respectfully yours,

H. L. HARRIS.



**Vincent's Angina.**<sup>1</sup>—Dr. Douglas Wood has given an excellent review of this infection, and states that it is almost always complicated with pyorrhea. As this is probably another instance of the evil done by oral sepsis, the matter should receive renewed attention. Vincent found the cause to be spirochaete and a fusiform bacillus, which some think are different stages of the same protozoal organism allied to the Treponema Pallida. Vincent also found it in hospital gangrene in Algiers. The angina is transmitted by contact or by drinking from the same cup. It may live in tooth sockets a long time before spreading to the mucous membrane of the throat.

*Diagnosis in a Typical Case.*—1. A superficial membrane with or without a superficial ulcer.

2. Most common location about the follicles of the tonsils or on the soft palate.

3. Generally unilateral.

4. Nearly always associated with pyorrhea.

5. Comparatively free from constitutional disturbances.

6. Little pain except on motion. Much less than in tuberculosis or quinsy ulcers, but rather more than in tertiary syphilitic ulcerations.

7. Glandular enlargement much less than in diphtheria.

8. Little reaction outside of part infected.

9. The crucial test is finding the spirilla and so-called fusiform bacilli, especially when the condition resembles diphtheria.

*Treatment.*—Various antiseptic solutions have been used. As most of the infections start in or about the follicles, I have had best results with silver nitrate. First, cleaning out the crypt, or in case of an ulcer, the base, with hydrogen-peroxide, then fuse silver nitrate on a probe and touch up the ulcer. In the case of the crypt, cauterize to the bottom. The pyorrhea must be treated by a dentist successfully. Touch up the gums with the tincture iodin and give them  $H_2O_2$  gargle because the organism is anaerobic. Later, take care of the hypertrophied tonsils, adenoids and nasal conditions. Pike says it is hard to get rid of the spirilla even after teeth are treated and the pus is gone. You may have to use the silver nitrate three or four times. All of my cases responded very rapidly to this treatment.

Potassium chlorate internally and as a gargle has been said to be a specific. This is not my experience but I do believe that silver nitrate is as much of a specific as anything.

*Conclusion.*—Vincent's Angina has been known only for a few years. It is compara-

tively common and without being recognized, would account for the many unsuccessful results in the treatment of angina that would otherwise be simple. Four of my cases, gave a Wassermann positive. We know that the sleeping sickness and the syphilitic spirilla give a Wassermann positive. The question arises as to the effect the Vincent's spirilla would have on the Wassermann test, especially in a chronic condition. Several cases of Vincent's have been reported cured with Salvarsan.

**Ocular Vertigo.**—By ocular vertigo Brav means that condition in which the sense of equilibrium is temporarily disturbed, so as to make objects that are ordinarily fixed in space appear to move in a wheellike fashion, and which is caused by some ocular disturbance. To have actual vertigo (not an ordinary dizziness) there must be a disturbance of objective as well as subjective orientation, which interferes with our sense of security in space.

Normally, we have acquired the sense of appreciation of the relationship of objects in space to one another, and we are able to ascribe them to the place they actually belong, by means of the law of protection of the retinal image outward. This is known as objective orientation, and depends upon a purely physical basis, upon the place of the retinal image, that is, its relation to the fovea centralis. This, however, would be insufficient to establish our sense of security in space. In order to possess perfect physical poise, or the sense of security, we must also have a definite relation of our body in space and the relationship of our body to objects that surround us. This knowledge we obtain from the muscular sense of our extrinsic and intrinsic ocular muscles in their state of activity. This we call subjective orientation. Thus our sense of security in space depends largely (if not altogether) upon the knowledge of the relationship of objects to one another and the relationship of our own body to the objects surrounding us.

The sense of security in space is probably a psychic problem, but, like all other psychic phenomena, it depends upon a physical sensation. Appreciation of light, recognition of form, perception of depth, determination of dimensions—all these complicated psychic phenomena are probably essential to our sense of security in space. Our position in space necessarily depends upon our visiomuscular apparatus. It may be conjectured that all vertigoes, or vertiginous spells, are the direct result of some ocular disturbance, although the ocular disturbance may not be a primary condition, but a secondary phenomenon (perhaps temporary) caused by some organic or functional disturbance, or some toxic substance elsewhere in the body that directly or indirectly acts upon the muscular or accommodative apparatus of the eye. The semicircular canals, if they play any part in our sense of security in space, are only

accessory elements, but not primal factors. The chief causal element of vertigo, therefore, must be found in a disturbance of our oculomotor apparatus. Delusion of space, of depth, of distance, of dimension may under certain circumstances temporarily destroy our relation to objects that surround us, interfere with our power of fixation, unbalance our equilibrium, disturb our objective and subjective orientation, and give rise to vertigo.

#### CAUSES OF OCULAR VERTIGO.

The causes of ocular vertigo may be tabulated in the following way:

1. Disturbance of motility.	(a) Paralysis of the external ocular muscles. (b) Spasm of the external ocular muscles.
2. Refractive astigmatism.	Simple. Compound. Mixed.
3. Accommodative.	Spasm of the ciliary muscles. Paresis of the ciliary muscles.
4. Disturbed relation between accommodation and convergence.	

**The Production of Experimental Nephritis by Repeated Proteid Intoxication.**—Dr. Warfield T. Longscope of Columbia University, N. Y. has reported his observations of the kidneys of animals which had been sensitized by horse-serum or egg-white intraperitoneally injected and then given repeated small doses of the same proteins either by the peritoneum, subcutaneously or intravenously. If large doses were given the animals died from the acute anaphylaxis, but by the smaller doses the chronic poisoning caused profound changes particularly in the kidneys. These observations have a vital bearing upon the etiology of human nephritis and bid fair to go a long way in clearing up the matter so that we can prevent and cure this great modern scourge. It is to be devoutly wished that the inhuman antivivisectionists will not be given the slightest consideration in their efforts to stop such experiments, but on the other hand that they will be treated as public enemies if they attempt it.

Longscope concludes as follows:

The repeated injection of small doses of horse-serum and egg-white in dogs, cats, rabbits, and guinea pigs that have been sensitized to these proteins, causes injury to the cells of various organs and tissues with resulting inflammatory reactions.

The changes are especially marked after intraperitoneal injections in the peritoneum and after intravenous injections in the livers of rabbits and cats, and in the myocardium and kidneys of all groups of animals.

<sup>1</sup>Dr. Aaron Brav, N. Y. Med. Jour., Nov. 15, 1913.

'Journal of Experimental Medicine, Dec. 1, 1913.

In dogs and rabbits, especially, there develops a well marked nephritis characterized by degeneration and necrosis of the epithelium of the loops of Henle, of the collecting tubules, and less frequently of the convoluted tubules. This is accompanied by an extensive small round cell infiltration of the interstitial tissue and later the formation of connective tissue. Together with these changes there are acute and chronic alterations in the glomeruli of all groups of animals.

Egg-white in large doses is itself injurious to the kidney of animals, but this slight primary toxicity is probably greatly enhanced through previous sensitization of the animal.

**The Differential Diagnosis Between Gall-Stones and Gastric Ulcer.<sup>1</sup>**—The pain in colic is, of course, severe, doubling the patient up, making him roll about, sweat, and vomit, usually with much retching. It is often associated with attacks of shivering. During and immediately after an attack of colic, the upper right belly is very tender and often rigid. Owing to this rigidity, gall-stone colic is easily mistaken for perforation of a gastric or duodenal ulcer, and the reverse mistake may be made in cases of perforation of a duodenal ulcer.

The points, which are most helpful in distinguishing between the two conditions, are:—

Rigidity is usually more marked and more general in the case of a perforated ulcer.

The patient with colic rolls about continuously, crying out with pain; whereas in the case of perforation of the stomach or duodenum, he lies flat on his back with his legs drawn up, keeps very still, is usually quiet and is often slightly cyanosed.

The sufferer from colic usually vomits with much noisy retching; the perforated gastric, if he vomits at all, does so with but little retching.

Duodenal ulcer cases, apart from perforation, sometimes have severe pain closely resembling gall-stone colic, and I have seen cases during an attack of pain, which I should certainly have diagnosed as gall-stone colic but for a knowledge of their previous history.

Severe colic is, however, rare in cases in which gall-stones are confined to the gall-bladder, which is no doubt the reason for the tradition of the symptomless gall-stones.

**Treatment of Fistula in Ano.**—When much pus is being discharged, says P. L. Mummary (*Lancet*), or a large abscess is present, an operation for fistula in ano should not be performed. The proper treatment is to insure free drainage, if necessary, by enlarging the existing openings for the purpose, and to have the tracks and pockets frequently irrigated with hydrogen peroxide, or some other suitable antiseptic solution. Frequently fomentations and hot baths will also assist. All this saves time in the end, as it much reduces the size of the wound required at operation.

<sup>1</sup>By C. M. Kennedy, F. R. C. S., *The Practitioner*, Nov., 1913.



**Vaccine Treatment in Oral Sepsis.<sup>1</sup>**—Dr. Leon S. Medalia of Boston reports excellent results in "The Use of Bacterial Vaccines in Acute Septic Conditions of the Oral Cavity met with by the Dentist." The vaccines are produced in the usual way.

**Method of Administration.**—The vaccines are thin, slightly cloudy, watery fluids, are kept in bottles covered with rubber caps and are administered subcutaneously with a hypodermic syringe, previously sterilized. The dose and interval of time depend upon the local reaction of the patient, the particular condition treated, and the clinical response to the treatment. All these points can only best be determined by one who has had experience in this special branch of medicine or one who is specializing as an immunizer. Generally speaking, however, the treatments are begun with the minimal dose and repeated in acute cases as soon as the soreness in the upper arm at the point of inoculation is practically gone (usually at the end of 12 to 24 hours). Later, when improvement takes place the treatments are given less often. In subacute or chronic conditions the treatments are given once every three to five days or less often.

**Underlying Principles of Vaccine Treatment.**—The principles underlying this treatment are briefly as follows: The vaccine when administered subcutaneously stimulates the tissues of the patient, in a way unknown to us, to produce substances inimical to the live bacteria responsible for the infection. These substances circulate in the blood and affect the whole system, antagonizing the infectious process in whatever part of the body it happens to be. The protection acquired by the patient against the bacteria in this way is known as *active immunity*, because the patient takes an *active* part in its production. It is in contradistinction to *passive immunity*, such as the protection against diphtheria acquired by the patient through the administration of antitoxin. In the latter case the child suffering from diphtheria takes no active part in the production of the protective substances. These protective substances in case of antitoxin against diphtheria are produced by the horse whose blood serum is used in the form of antitoxin and not by the child or patient who is treated.

He concludes that, 1. Vaccine treatment is of value in acute septic dento-alveolar abscesses—even the worst types of mandibular impacted third molar abscesses have apparently yielded well to this treatment.

2. Such cases with septic apical abscesses, especially the deep-seated ones or the so-called

blind abscesses, acute and subacute, have been greatly benefited by the vaccine method of treatment.

3. I believe that there is a big field for vaccine treatment in acute and subacute dento-alveolar abscess cases and its wide-spread use will save considerable suffering and loss of teeth to the patient, and annoyance to the dentist.

**The Treatment of Puerperal Streptococemia with Intravenous Injections of Magnesium Sulphate.**<sup>1</sup>—“Technique of the Injections.—2 per cent. solution of chemically pure magnesium sulphate is prepared with freshly distilled water. This is filtered and sterilized in half-liter flasks in an autoclave. This solution will not hemolyze human red blood cells, and I have found by experience that prepared in this way it will not cause any temperature reaction in the patient. Formerly a 1 per cent. solution of magnesium sulphate in physiological salt solution was employed, and a chill or sharp temperature rise frequently followed the injection. A simplified salvarsan apparatus is preferable for the injection but the ordinary infusion set will answer the purpose quite as well. It is important not to cut down upon the vessel, as by direct puncture the same vein can be used a number of times. As many as eight punctures of the same vein have been made on different occasions. The secret in getting into the vein is to make it markedly prominent. This is done by temporarily placing a constricting rubber tube about the upper arm just tightly enough that the faintest pulsation may be felt in the radial artery. If the constriction about the upper arm is too tight, the arterial as well as the venous circulation will be cut off and the vein will not distend with blood. The needle is inserted in an oblique direction, the spurting of blood from the open end indicating the proper entrance into the vein. The rubber tube of the reservoir with the solution flowing in then rapidly slipped over the shoulder of the needle. The reservoir is held at not more than one foot elevation, which will run in 400 c. c. of the solution in about twenty minutes. The injection should be made much slower than the ordinary saline infusion.

The patient experiences a sensation of heat toward the end of the injection, and frequently feels faint, although the pulse usually gains in quality. A small drink of hot whiskey or aromatic spirits of ammonia will steady her. Occasionally the respiration assumes a sighing quality, but no decrease in rate or in depth of the respirations has been observed. It is quite evident that the dangers are not so marked, the drug is not so toxic, when given intravenously, as when employed intraspinously where it is applied directly to the nerve tissue.

I have given as much as 400 c. c. of a 2 per cent. solution intravenously simultaneously with 400 c. c. by hypodermoclysis, representing 16 grams or 250 grains of the drug, with no alarming effects. Whereas by intraspinous injection for the production of anesthesia, or in the treatment of tetanus, Meltzer (6) advises 1 c. c. of a 25 per cent. solution per 20 pounds of body weight, or about 25 grains for a 130-pound individual, as the safe limit. The injections should be repeated every second or third day according to the course of the infection as revealed by the temperature chart.

The method has now been employed in fourteen cases at the Lying-In Hospital. In five of these there was a streptococcic bacteremia as proved by blood culture. The other nine were all severely infected women with high temperatures and acutely ill with streptococcic toxemia, with pure growth of streptococci on uterine culture, but with negative blood cultures.

In forty-six cases of puerperal infection with blood cultures showing streptococci, previous to 1910, but three survived, a mortality of 93 per cent. In the five cases with positive blood cultures since 1910, treated with intravenous injections of magnesium sulphate, all but one have recovered, a reduction in the mortality from 93 to 20 per cent. While this is a small series upon which to base percentages, a perusal of the case reports and of the temperature charts will show that they were desperately ill patients, and of the class heretofore doomed to a fatal issue.

**Conclusions.**—1. In the quantities and dilutions described, magnesium sulphate is absolutely harmless when administered intravenously to women suffering with puerperal infection.

2. Magnesium sulphate is of more value early in the course of the infection than after secondary localization has occurred. In the chronic cases of secondary thrombophlebitis or pyemia it does not appear to be of benefit. Its action seems to be chiefly upon the organisms circulating in the blood.

**Decompression for Glaucoma.**—Dr. R. H. Elliott, a Lieut. Colonel of the British Indian Medical Service has been visiting America, demonstrating his now famous method of treating glaucoma by establishing permanent drainage. After dissecting down to the sclerotic, he trephines into the anterior chamber, the opening being about 1 to 2 millimeters in diameter. The fluid drained off relieves the pressure, and a continuous drainage is established under the conjunctiva sufficient to prevent a return of tension. The results are excellent. It seems remarkable that hot India should do so much for the advancement of medicine, for this is only one of a very long list of remarkable additions to theoretical and practical medicine made by the famous Indian Medical Service.

<sup>1</sup>Dr. James A. Farrar of New York, *The Am. Jour. of Obstetrics*, November, 1913.



# GENERAL TOPICS

## A Well Known Chemist Becomes Consultant.

Dr. J. T. Ainslie Walker whose two year term of service as consulting chemist with a large manufacturing company was completed the first of the year, has decided to remain in this country and establish himself independently as a consulting chemist and bacteriologist.

Dr. Walker is known in scientific circles the world over for his researches in chemistry and bacteriology. His work in England previous to his coming to America brought him especially to the front, his co-labors with Dr. Samuel Rideal leading to the evolution of the Rideal-Walker Test for the standardization of germicides being particularly noteworthy. Indeed the development of this test has been generally recognized as one of the most important contributions to modern sanitation, since it has been the means of placing disinfection on a sound scientific basis. The economic and practical benefits that have followed the adoption of the Rideal-Walker Test tell in no uncertain way of its far reaching importance.

Dr. Walker has made many notable contributions to scientific literature and his staunch advocacy of the high coefficient spray has won him a large following.

The frequency to-day with which health boards, municipal water and sewage plants, commercial industries, public and private institutions, etc., have to enlist the services of expert chemists and bacteriologists makes it certain that Dr. Walker will achieve a gratifying success. It is a matter for sincere congratulation to all who may have occasion to consult Dr. Walker, that the services of a man of his ability and experience are now available.

**The Pharmacopoeia and the Proprietary Remedy.**—The editor of the *Medical Council* affirms that a pharmacopoeia is purely a book of standards, serving as an authority for druggists in compounding physicians' prescriptions. Those drugs which are used extensively by physicians should have some standard by which both the physician and the druggist can be enabled to use them intelligently. Used they will be if physicians choose to use them and the duty of the revisers of the U. S. P. is to find out and publish the best process for the pharmaceutical manipulation and preparation of them, whether they approve of them or not.

Thus many physicians use such discredited drugs as cactus, viburnum, bryonia, arnica,

buchu, etc., and think they get good results from them.

The pharmacologist objects to them chiefly on account of the limitations of his own science, chemistry, but the practitioner is unwilling to wait until the pharmacologist catches up with what he has learned by experience. If the pharmacologists dominate the revision of the U. S. P. it will result in loss of influence for the U. S. P.

If the doctor can't get what he wants in one place he will get it in another and he does not care if the particular drug which he wants is called a *nosrum*, for this term of reproach is not of equal significance to all men. The maker of proprietary remedies says to the doctor "we take just as much pains in preparing these old, non-official drugs as we do in preparing those which are official and you can depend upon their reliability when our name is connected with them." This being the case and the remedies in question being vouched for by ten thousand to fifteen thousand reputable physicians a medical journal is as much justified in advertising such drugs when ethically prepared as in advertising such a proprietary as chloroform, for example. In other words if it is proper to advertise a new and non-official remedy it is equally proper to advertise an old and non-official one when both are honestly advertised and marketed at a fair price.

The synthetic proprietary chemical came as a substitute for drugs which had been discredited but only a few of the myriads which have been imposed upon the profession have made good, and the doctors have concluded that the scientific chemists know less about their requirements than they do themselves.

As a result the advanced scientist accuses those who disagree with him of ignorance and commercialism, forgetting that the doctor will stop prescribing that which he has found to be of no use. The pharmacologist is therefore advised to find out what the doctor really wants and then revise the U. S. P. constructively. The leaders of the profession and the rank and file should get together in this matter, in a spirit of cooperation.

This advice is good. It is seldom convincing to a man who thinks he is right to hit him on the head for the purpose of showing him that he is in the wrong, and this seems to be the policy in certain high and by-no-means self-abasing medical circles. Teach, edify the profession. Yes, but by reason, not by a show of assumed authority.

It is not what the best men do, but what they are, that constitutes their truest benefactions to their fellow-men. Certainly, in our own little sphere, it is not the most active people to whom we owe the most. It is the lives like the stars, which simply pour down on us the calm light of their bright and faithful being, up to which we look, and out of which we gather the deepest calm and courage.

PHILLIP BROOKS.

# American Medicine

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and

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PUBLISHED MONTHLY BY THE AMERICAN-MEDICAL PUBLISHING COMPANY.

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Complete Series, Vol. XX, No. 2.  
New Series, Vol. IX, No. 2.

FEBRUARY, 1914.

\$1.00

YEARLY  
in advance.

The ban on Piorkowski's turtle tuberculin by the United States Public Health Service, has been something of a shock to all those who have been investigating it and who think it presents definite possibilities for benefiting humanity. Quite a large number of Germans and some Americans are convinced that it has already shown its usefulness. The late Prof. Klebs was the pioneer in its discovery. Its history seems to be paralleling that of Koch's tuberculin. Friedmann's fiasco is almost identically the same as that following the introduction of tuberculin. There were some far-sighted men who saw the possibilities and they can praise God on bended knees that there was then no Public Health Service to prevent traffic in tuberculin which is now doing incalculable good, thanks to their labors. We have foreseen that such action would characterize a Department of Public Health, and its enemies now have exactly the kind of ammunition they need to prevent its organization. Indeed the situation is so serious to progressive medicine, that there may be a demand that the Public Health Service be deprived of its power to prevent or hamper honest traffic in any remedy. We do not pretend to offer any opinion as to Piorkowski's vaccine, but it is reasonable to assume that it may be of extreme value if those working with it are so convinced. If they are correct, it is

horrible to prevent their obtaining the material to save life. We hope that for its own welfare the Public Health Service will reverse its policy, and place no restrictions on medical freedom. We are much afraid that the prospects of a National Department of Health will be permanently destroyed if it is popularly believed it will restrict progress. A few doctors in office cannot be expected to know as much as the hundreds of thousands out of office, and must not be given power to hamper the labors of all the rest. Officialism is bad enough anywhere but it is particularly disastrous in medicine.

The publication of medical knowledge in lay journals has become a very live matter. A committee of the New York County Medical Society has been investigating it, with a view of devising some checks to the near-quacks within the ranks, but so far without being able to think of any practicable preventive. If a commercial man has something to sell, he is absolutely compelled to advertise it. Those who need that thing are really injured if he does not let them know. Men who possess special skill must also make the fact known, not only for their own advantage but also for the benefit of those needing such advice or service. This is a sociologic necessity but the trouble always is, and always will be, that many a man over-estimates his own

powers, while scoundrels lie about theirs. Open advertising therefore is self-regulating because sensible readers make allowances. The evil doers are those who are continually using lay journals to call attention to ordinary work as though it were extraordinary. A certain surgeon is known to have a regularly organized press bureau almost like a circus—and some of his work is worse than inferior. He is thus attracting buyers for that which he does not possess—and is a swindler though in good standing. The really good surgeons depend upon the advertisement of their successful cases, and without many exceptions, their practice grows according to their ability. "By their works shall ye know them." If a commercial advertiser lies, the swindled ones can often get redress at law, but if a sick man dies from poor service when he thought he was buying the best as advertised there is no redress.

Self-advertisers must be repressed as vigorously as the quacks, but no one seems to know how to proceed, especially against those sly fellows who are apparently dragged into the lime-light under protest. Perhaps a quiet ostracism might be effective. On the other hand, the public are entitled to know all about the men who are doing great things in medicine and surgery as well as in canal building and canal sanitation. Indeed we all know too little of such men as Paul Ehrlich and Wm. Arbuthnot Lane, and perhaps too much of a few engineers and sanitarians. It might be impossible to check the self-advertisers without checking desirable publicity of the workers. So perhaps we may have to worry along with present evils.

**Medical instruction of the public** is an entirely different matter. There is no

dissent from the assertion that the public is entitled to know of all new discoveries and occasionally to have the old ones explained to them over again. Sanitation is utterly impossible with an ignorant population, for they resist reform, violate laws and regulations, and withhold funds. The more enlightened a community, the easier it is to prevent the preventable. The lay press must be kept full of medical facts and the theories built upon them. The danger of misinterpreting or exaggerating the data is infinitesimal compared with the dangers of ignorance. The material should be supplied by learned and progressive physicians, and yet any practitioner who tries it, is often charged with self-advertising for ulterior motives. The vast majority of the profession shuns such social work as they shun the devil, and leave it to laymen who too often garble the facts and twist the theories. It has been suggested that societies might supply the material officially, but this will never do because official medicine is always behind the times. It is still calling attention to the danger of adults contracting tuberculosis whereas we have all been proved to be tubercular already and saved from galloping consumption by the auto-vaccination of our own lesions. Advances are always made by the iconoclasts who defy authority. The public must be made aware of the work of these fire-brands even if errors are made now and then by misguided enthusiasts. At this very moment the war against tuberculosis is being hampered by the orthodox views which direct efforts into the wrong channels. So we must let things drift along as they are for the present. A few lay journals, especially the *New York Times*, have done incalculable good by their policy of upholding scientific medicine, and there is no ground for the

worries of the elect. We strongly approve of doctors writing for the lay press—if they make errors, they are so quickly checked that they do no harm, and the public gets the facts first hand. Prof. T. D. A. Cockrell, in reviewing the scientific but popular articles written by Sir Ray Lankester for the *London Daily Telegraph*, scolds the daily press for inaccuracies, but strongly approves the system of public scientific instruction through lay journals. (*Science*, Feb. 6, 1914.)

**Removal of the ban on medical publicity** has been almost unanimously recommended by the Council on Health and Public Instruction of the American Medical Association, and the subject is to receive consideration at the next annual meeting of the full Association. As we understand it, the proposition is not only to authorize physicians to write for lay journals as a matter of public instruction,—a system which AMERICAN MEDICINE has advocated for years,—but also to permit the use of the advertising columns to call attention to their own wares. It has long been permissible to insert one's name, address and specialty in the local papers of small towns, but the practice has largely become obsolete because it was an unnecessary expense where everyone in town knew every doctor there. It may be all right for reputable institutions to advertise themselves to the lay public, but we are inclined to think it too will become a needless expense, as the sick man or his family will invariably ask the medical attendant as to the standing of institutions and be guided by his advice. Whether individual physicians or the public will gain anything by personal advertisements of special skill

for sale, is exceedingly doubtful in a profession where physicians have been known by their works and not by their words. The public may be temporarily attracted by such claims, but in the long run modesty appeals to them far more, and they instinctively discount self-assertions. The present system is the survival of milleniums of experiments and seems to be the fittest for survival, no matter what new experiments we try. So we are sure that no harm can come if we do decide to allow advertisement. The fittest way will again survive, and if personal advertisement proves unfit it will disappear.

**The laborer is worthy of his hire**, and if a physician thinks his own services are not worth anything he ought not to accept a fee. The time is fast approaching when gratuitous service will be valued as worthless. A lawyer is never required by a court to work for nothing, and many a lawyer is amazed when he learns that physicians are expected to work for hospitals and dispensaries without pay. It is generally asserted that these volunteers get a great deal out of their positions in the way of experience and are highly paid in that they are being educated so that they can practice outside for fees. If this is so, then let the fact be published to the world and a list drawn up of all physicians and surgeons serving hospitals and dispensaries without pay, so that it will be known that they are not as competent as private practitioners but are really under instruction to enter private practice. We put the matter in this bizarre fashion to direct renewed attention to the harm done by gratuitous service. A doctor, like every other worker, should be paid by the city for every minute he spends on the

city's poor. Our charity organization folks are all under salary, and yet calmly ask the doctors to work for nothing. In every other civic matter, the trend of thought is in the direction of paying enough to secure efficient service, even though it be counted in tens of thousands of dollars for exceptional men. If all physicians would take more interest in civic matters they would not now be in such a disgraceful situation,—serving for nothing while an engineer is given \$20,000 a year.

**The modern movement against unpaid civic service** is very strong because it throws the positions into the hands of the wealthy who instinctively work for their class. The British House of Lords is doomed for that very reason. It has persistently blocked all progress in the direction of benefiting the masses and is an anachronism; though the barons built the foundation of their own liberties by the *Magna Charta* they did not want to share with commoners. Even the English system of voluntary unpaid service in county councils and so on, to which we referred with approbation as an incentive to rich young men to enter public service, is being violently attacked. Circumstances alter cases so profoundly, that it is not likely such a system would work anywhere else, indeed James Bryce said it wouldn't,—but the English "muddle along" with it quite well even though it is generally believed they could do better. A corporation must pay all workers, managers and directors, many of whom are also owners. The only unpaid work a partner can do is attendance at a stockholders meeting. Similarly, society must pay all workers, managers and directors, and the only unpaid work a citizen or stockholder in the civic corporation can do

is attendance at town meeting or mass meeting. We hope physicians working for charity will take this lesson to heart and realize what harm has been done in the past. The time is coming when most physicians will be under public salary, and the time is already here when they should be paid for public service. We do not advocate a strike, but it would not be an unmixed evil.

**The socialistic control of all healing institutions** is a startling suggestion, but it is being discussed quite seriously by men noted for conservatism. It is even thought that the expenses should be paid by the public now, though no one seems to have considered what that would do to the tax rate. It is pointed out that economy has forced other small businesses to combine, because competition is replaced by co-operation and expenses are also reduced. The same rule might apply to hospitals which are already specializing in a way which makes for co-operation. In addition the trend of civilization is unquestionably in the direction of making the healing of the sick a public duty rather than a family affair. The social organism is discovering that it is healthier itself, if it restores the health of the units of which it is composed, instead of allowing them to die for the want of a little public assistance. Almost every year witnesses some new departure in municipal management whereby the people individually are more efficiently guarded from disease and helped to recover if they should be disabled. A man may recover damages if he contracts a disease from which society should have protected him. A few centuries ago, the sick man could get only such help as his family could give and as that has proved insufficient everyone instinctively

expects some public help. Even the very rich call for nurses who have been trained in semi-public institutions and demand police protection from annoyances preventing recovery. That is, the sick are already dependent upon society for recovery and it is merely extending this system if hospitals become social institutions. The financial part need not worry us,—a solution will be found when the time comes. At present the trustees of private hospitals would do well to so order their affairs, that the transition to the inevitable public status will be a jarless and quite insensible movement.

the practitioner. We have wandered too far from the old apprenticeship system and must get back. The student must learn by actual personal observation, not only how one man practices, but how others, differing in methods, get equal results. That is, the hospital visiting staff must be used to supplement the work of the whole-time professors on the college staff. The title of professor would not be cheap, by a long shot, but would be a coveted honor. This system seems to be as inevitable as public control of all hospitals, and we might as well trim our sails to shifting winds.

**The waste of clinical teaching material in private hospitals** is really scandalous. The utilization of the cases now seen by no one except the doctors and nurses is the superlative benefit of a public status. This does not mean that every hospital patient is to be pawed over by a horde of none too pleasant students. Privacy is always respected when desired and indeed it is a duty when we find that exhibition is so annoying as to interfere with recovery or even if it is embarrassing. As a rule, sick people are rather proud of being interesting cases, and are not at all adverse to being the subject of instruction to students. Some public invalids feel rather neglected if they are not used. It would then be a step in advance if all visiting physicians and surgeons of all hospitals were placed on the teaching staff of colleges with the title of professor, and in return for a reasonable salary, have a few students assigned to them for periods of a few weeks or months to accompany them every morning on their rounds as in Paris. The day of the purely didactic professor is passed anyhow, and the mere demonstration must give way to

**The teaching of physiology to medical students** was the subject of the annual address of the chairman of the Section on Physiology and Experimental Medicine of the American Association for the Advancement of Science—Dr. J. J. R. Macleod of Western Reserve University (*Science*, Jan. 9, 1914.) It was something of a reply to the increasing opposition to compelling students to spend many hours in the laboratory doing things which they will never be required to do in the wide world,—that is, if they are to practice medicine and not become research workers. We are afraid that Dr. Macleod has not established his case, and indeed he acknowledges that demonstrations would serve the purpose, for he says that no student can do all the experiments. Each class is divided therefore into groups of 5 or 6, and each member of a group does an experiment for the group. Why not let the instructors do the work and show it to all? Yet he says it is as necessary for each student to participate in mammalian experiments as it is for an engineer to have a practical knowledge of engine construction by actual experience. At that rate, each

student should be required to perform every conceivable surgical operation he may be called upon to perform later. This is a bit like the man who complained that his boots were so small that he could not get them on until he had worn them a week. We are afraid that the complaints lodged against the physiologists are well founded, and that they are wasting the valuable time of students who spend many hours doing things, which can better be explained verbally in a few minutes. The pathologists who were once grudgingly given a few hours a year have long argued that the student would be better off if the time spent in laboratory experiments were devoted to post mortem examinations. Experience seems to be on their side. We are evidently on the eve of a shake-up in medical curricula.

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**Denials of the contagiousness of leprosy** are becoming quite frequent and emphatic, yet the demand for the isolation of lepers is growing into a real leprophobia both here and in Europe. Paris has been startled to know that lepers have flocked there for years and that there are now two or three hundred domiciled in that city. Everyone of them has contracted his disease in endemic territory, chiefly the tropical colonies, and not one of them has transmitted the bacilli to anyone else. Nevertheless there is a strong demand that they all be arrested and taken away for confinement in some distant asylum. A different story comes from London where there are very many lepers who are driven from one boarding house to another, shunned by their friends and relatives. An asylum is proposed for their sake and not for the remote possibility of their giving the disease to

others. New York has had lepers for years, but as far as known they all contracted the disease in the tropics and have harmed no one here. In spite of these facts, the popular fear of the disease is so great that our professional treatment of known lepers is brutal in the extreme. Curiously enough, the same facts as to this infection are used by both contagionists and non-contagionists. Very few attendants at leper colonies contract the disease, but those who do, may not have taken the infection from their charges, but in the same way that all others get it and no one knows how that is. There are endemic territories here and there all over the world though the vast majority are in or near the tropics, and in these areas it is practically impossible to tell whether the disease is a result of contact or infection from lower animals such as fish. Five per cent. of sewer rats of Paris have leprosy but they do not give it to man. The same phenomenon has been observed elsewhere.

**The contagion theory of leprosy** is strongly stated by Bayon in the *London Lancet* for Nov. 29, 1913, but it is far from conclusive to his opponents. Segregation is said to have diminished the number of lepers in the Philippines but others state that the numbers are about as great as ever. It is curious that those who are most strongly of the opinion that prolonged contact is dangerous, are themselves perfectly fearless in handling lepers. Inoculation experiments have failed except in one instance, and he was in endemic territory and had also been in contact with lepers. The hereditary theory is not dead by a long shot. In Japan it is quite vigorous because investigation always shows cases in the relatives of lepers, even if the parents are free of it. This is not at all conclusive,

one way or the other. Five to ten per cent of children of lepers become leprous and about 3 per cent of those living under the same roof. This evidently may be due to heredity, contact, infection from a common source in some lower animal, or by an insect such as bed bugs. The whole subject is paradoxical and will not be cleared up until some one finds how the infection really is carried to us. Until then, let us be a little more gentle with the lepers in our midst, for they have never been known to do harm—at least in New York City. Dr. Wm. Goodhue of the Molokai Colony in the Hawaiian Islands is reported to be curing early cases through surgical means, while Chaulmoogra oil is credited with curing others. The outlook is becoming so cheerful, that the disease is losing its terrors.

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**A discouraging report on venereal prophylaxis** has been made by Surgeon Robt. A. Bachman of the Navy (*Medical Record*, Oct. 4, 1913). He shows that Metchnikoff's 33 1-3 per cent ointment of calomel applied within an hour of intercourse is generally effective in preventing syphilitic infection and that there are several more or less efficient irrigations or ointments, destructive to the gonococcus if used soon enough,—the silver salts being the best. Nevertheless he repeats his conclusion of the previous year: . . . "prophylaxis is possible but it takes a great deal of care and vigilance on the part of the medical officer and the double method must be very vigorously applied in order to be effective. In civil life where strict routine and control of men are impossible it is impracticable." This is quite disappointing as we were all greatly impressed by the early reports of the wonderful successes achieved. Indeed there were hopes expressed as to the eventual conquest

of all venereal diseases by these preventives. We ought to have known that human habits can not be changed in a jiffy, and that young men would not resort to the new system unless compelled. We cannot change the leopard's spots and we must take humanity as it is and not as it should be, to fit our schemes for its welfare. Consequently, pessimistic as it sounds, illegitimate congress and venereal diseases seem to be humanity's fate for a long time to come. To some minds, it is an evil thing to make vice safe. They think that the same time and money spent on teaching young men that continence is best, would produce a far greater reduction of these diseases, than by showing them how to avoid the wages of sin. Practically we must keep on and save men from the consequences of their own folly and ignorance as much as we can. Most diseases are results of folly and ignorance, and our campaign of sanitation is to make living fool-proof. Still, one cannot help feeling degraded by the medical profession's role of assisting prostitution, for after all is said and done, these physicians are really attendants to the houses. We might ease our conscience a little bit by inventing a prophylactic which does not require supervision—but that is only beating the devil around the bush. Most men won't use it anyhow.

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**The possible early conquest of hook worm and typhoid fever in our south** is the cheery news sent north by the health authorities who have been trying hard to awaken the people to the dreadfully insanitary habits which have allowed these two diseases to spread so extensively. It is to be noted that the greatest mortality rates from typhoid fever in the United States are in the districts furnishing the largest number of cases of hook-worm. The infection

is spread in the same way in each case—the careless method or lack of all method of disposing of excreta. The primitive habits of the lower classes may not be harmful in very sparsely settled areas, if they go far enough from the house, but where the entire area around the shack is a huge cesspool, the wonder grows that anyone is left alive to tell the tale. God is certainly good to the foolish, and preserves them where angels fear to tread. It now seems that one of the greatest campaigns of education in the history of sanitation is now progressing throughout the whole South. It took a long time to wake up, but now that they are awake, they seem destined to achieve results which will snatch the laurels from northerners. There is a tremendous lot of work yet to be done, and it needs men and money, but they both seem to be forthcoming. Our southern friends have resented northern gifts which placed them in the theoretic position of dependents unable to care for themselves, and are now proving that their resentment was justified. Soon we will be able to tell invalids who wish to go south in winter, that they will be safer from typhoid there than in France or Italy. If any public servants ever deserve a monument, it will be the sanitarians of our southern states. The people are learning that insanitary conditions prevent prosperity, as the Jamestown Exposition realized to its sorrow when people stayed away because of typhoid. The doctors who called typhoid by other names and then denied its existence and tried to persecute those who reported it, are the real enemies of the southern people, and have delayed progress to better things all these years. Life insurance statistics seem to show that since the policy of concealment has been abandoned and real sanitation applied, the improvement in southern

death rates has been greater than in any other part of the world.

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**Our diminishing meat supply** is causing considerable alarm among those who believe that a liberal amount of mammalian flesh is necessary in the dietary for health. Foreign nations which outstrip us in their contributions to the advance of civilization, subsist on far less meat than the American nation, so we need not worry yet awhile. Their workmen are fully as efficient as ours wage for wage. Still, this is a different climate and we may need things which are not necessary in Europe, so that the question is an open one and the medical profession must observe the effect of the gradual elimination of meat from the dietary of the poor. When this land was thinly settled and there was plenty of grazing, meat was within the reach of all three times a day and some physiologists think we ate too much of it. The farms have always encroached on grass lands and always will, though we may never reach the condition of Japan where every inch is under intensive cultivation. The demand for cereal food is so great there that practically no land can be spared for cattle, and the poor depend upon fish and pork. Nevertheless we are constantly drifting in that direction. In the short time since 1910, our population has increased by about seven millions, while the cattle have diminished by seven millions. The increasing demand has raised prices so that the fewer cattle are worth more than the many existing prior to 1910. This kind of food must eventually go to the few who can afford it. The increasing importations of meat might give some relief but foreign nations are also bidding for it and prices seem destined to rise still further as in all the rest of the world.

**Populations regulate themselves automatically to the available food**, so that there is no cause for alarm over a possible chronic famine any worse than what always has existed. One-tenth of every population is at or below the poverty line the world over, and it cannot be more than that proportion for their death removes them imperceptibly. Our growth in numbers may be checked if we cannot buy food from foreigners, but for the life of us, we can not see what harm will result. It might be an incalculable benefit. Similarly there is no cause to worry over the gradual change in our food habits from the restriction of the more expensive meats. Our ancestors had quail, wild turkey and venison a plenty, but we do not mind their absence. Posterity won't mind the absence of roast beef—Heaven knows, millions never see it now. So there is no scientific basis for the doleful predictions of agriculturists as to the awful calamities when beef is beyond the reach of most of us, though the results of the restriction of all meats remain to be seen in America. Bad health is always connected with undernutrition, and those who think that the increasing cost of food is sure to bring calamity, must remember that conditions cannot get any worse than they always have been. Long before Malthus worried over a future universal famine, there was the same discussion of the increasing cost of living. In 1768, Oliver Goldsmith made one of the bailiffs in "The Good Natured Man" say: "What makes the bread rising? The *parle vous* that devour us. What makes the mutton five pence a pound? The *parle vous* that eat it up. What makes the beer three pence—half penny a pot—" Since then the price measured by metals, which are always getting cheaper, has progressively increased,

but the real cost measured by the effort to get it, is exactly the same as in Biblical days when men worked for a penny a day. Rent and food are twice the price they were a generation or two ago, if measured in gold which has half its former purchasing price. The pessimist must also remember that all other necessities are getting cheaper all the time from the improvement of machinery and transportation. As a result we live better and longer every generation, but our numbers depend on the food supply and shelter.

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**Taxing the unearned increment of real estate values** will soon be an accomplished fact if our city fathers accept the advice that has been offered in this direction. Physicians are vitally interested in this matter for it begins to look as though the money for much needed sanitary improvements cannot be raised by the old methods of taxation. We have previously referred to the proposition, though in an academic way as no one seemed to think it could be made practicable in the near future. So let us repeat the principle upon which the plan is founded. City land rarely or ever increases in value through the labor of its owner. A farm is made more valuable by the farmer's work, but city values increase almost solely because swarms of people move into the neighborhood and compete for the use of every tiny space. The land owner does nothing but raise the rent which the tenant must pay or emigrate. This principle is evidently considered axiomatic—increments of value are the property of those who create them. The farmer owns the increased value he has given to the farm and the city population owns the increased value they

have given to city lots. It is evidently impractical to deprive the land owner of this value, but it is considered by the commission as public property which the public loans to the original owner at one per cent interest. It is proposed, then, to call present valuation a basis for ordinary taxation for all future time, but all future increases not due to the owner's efforts or improvements are to be taxed at one per cent. We are strongly of the opinion that the rate should be what the city would have to pay for long time loans. It is compelled to borrow for sanitary improvements and it is only justice that these theoretic loans to property owners should reimburse the city at an equal rate. Much of the interest on the money to be borrowed to construct our gigantic sewage system will then be paid by the property enhanced in value by the people who created that increment of value and for whose benefit the sewage system is constructed. We beg physicians to think over this new taxation system to the end of hastening city sanitation and lessening the death rate. City lots will never cease to be objects of investment or even speculation. It will evidently be highly profitable to hold property which rises in value, because the result will be equivalent to borrowing money from the city at a low rate and increasing the rent at a high rate. It merely defines the ownership of increased land values, and there is justice in the plan to tax the unearned increment more than the earned. It is a pity that some of our estates cannot be considered public property now, but perhaps a big inheritance tax will rectify the matter in time. As for the productive estates of churches, another scheme must be devised, for we will never forget how one church used its funds to prevent the correction of dreadful sanitary faults. The funds were largely if not en-

tirely public property of the unearned increment class and used to harm the people who created them. We are a step nearer the sanitary and moral millenium by this new plan to tax these values as though they were interest-paying loans. The values are fictitious anyhow, as they have not counted the deterioration sure to follow if the harbor is to become a cess pool. We have already explained why the "pay as you go" principle is a bad business policy for small traders whose capital is profitably turned over several or many times a year. They reduce their highly profitable capital by the amount of the tax, whereas they could borrow at two per cent from estates owned by widows and orphans unable to use them in business. Our sewage bonds then will never be paid off, and this new idea as to the ownership of the unearned increment of value of property benefited by sewage plans, places the bonds in the class mortgages on our own property. We need not worry over our bonded indebtedness, for the money it represents is really earning very large interest in the hands of small traders saved from that much taxation. It is to be noted that we have always reimbursed owners whose property has deteriorated in value through some act of the people, and we must claim increased values similarly caused. It is therefore not such a violent revolution as one generally thinks when first told that unearned increments are public property.

**The cost of proper sewage disposal for New York City** will necessarily be large, as there is an enormous population to be served, but then there is an enormous population to pay for it. Those who balk at the expense should now realize that the present conditions must be ended sooner or

later and the sooner the better and cheaper. Moreover, the two English experts called in by the Metropolitan Sewage Commission, Dr. G. J. Fowler of Manchester, and Mr. J. D. Watson of Birmingham, not only showed the necessity for ending our present dreadful pollution of the harbor, but pointed out that even if we should construct a long trunk sewer to an artificial island at sea, the per capita cost would not be as great as many a small village has spent on its sewage system; and, we might add, much less than the per capita cost of the drainage of many a country house. So we must not be appalled at the great expense. Besides, the money will not be obtained by taxing the people, but will be borrowed on long time bonds, at small interest from people who have idle money and are unable to invest it. Men in small businesses where the capital is turned over frequently and yields a hundred or more per cent a year, cannot afford to give any of it up, if it is possible to borrow at two per cent. Estates can not afford to keep money idle when two per cent can be obtained safely. As we have frequently mentioned, good business does not permit of the payment of bonds if the money is earning more than the interest it costs. Consequently there is a growing tendency the world over to make permanent public improvements with borrowed money with a view of never paying off the bonds.

**Public debts are proofs of public prosperity.** As wealth increases, more of it falls to those who have not inherited the brains which accumulated it, and who must lend it at low interest or spend their capital. On the principle that it is better to build a house with money borrowed at 2 per cent than to rent at 6 per cent or take the money from a business which returns 20 per cent, nations, like corporations and business

firms, are piling up bonded indebtedness limited only by their ability to pay the interest perpetually. There is then no reason why prosperous New York City should not and could not borrow all it needs to build this vitally necessary sewage system. Public health as well as commerce will suffer unless we act soon. Other communities have had more difficult problems which have been cheerfully solved at greater expense, and we must awake to the fact that no community can dump its filth on another's property. It is now almost an international as well as interstate principle, that every community must take care of its own wastes. We have been pocketing the wealth that should have been devoted to this end, and must now disgorge. We trust that the medical profession will use all its influence to support the Sewage Commission in its study of the most practicable means of complying with the world wide demand for proper sewage disposal. Upon it depends future growth of population, wealth and public health.

**Drinking is a bar to railroad employments** and many roads have summarily dismissed servants who transgress. It is now said that on the Pittsburgh and Brownsville division of the Pittsburgh and Lake Erie, a branch of the New York Central, several hundred men have been or are to be dismissed for drinking. Warnings had been given and the action had long been contemplated. Evidently railroad managers have evidence that the slight mental enfeeblement due to a drink or two, has been the determining cause of accidents in situations demanding the keenest attention. We are glad of this new action and we hope it will become the rule. It will not do much to bring about universal abstinence—indeed

the evidence points the other way—but it merely shows that in all employments where the public is jeopardized by a narcotized brain, total abstinence must be made compulsory. It is immaterial whether the employee is helped or harmed by abstinence, for if he is in such a condition that he needs a few drops, he is unfit for these employments. Befuddled brains are causing too many automobile accidents, and it is now time to insist upon total abstinence in chauffeurs. We hope it will soon become a law, and that a chauffeur detected taking a drink of liquor shall be deprived of his license. It is a bit too soon to apply this rule to motormen and horse drivers, but in time they too will be included in this great movement for public safety. Would it not be well for doctors to think a bit as to whether they too will not be required to abstain in the interest of patients who are entitled to the best attention of an unnarcotized brain? It is rather shocking to think that a capable physician might be deprived of his license to practice if seen taking a drink, but greater changes than that have taken place in social customs.

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**The Vocational Education Survey** of the Public Education Association not long ago reported its findings in an investigation as to why there is such an unanimous desire on the part of children to leave school at fourteen. The investigators found that it was impossible for a child of fourteen to get work which it should have, and that it must be content with such employment as errand-boy, or mere drudgery which leads nowhere as it teaches nothing. Employees who want boys to learn a trade or business do not accept any less than sixteen years of age, because experience shows that younger

children are not developed sufficiently to learn. As far as preparation for life work is concerned two years must be wasted, and it is recommended that the schools be authorized to keep the children until they are fit to accept "learning" jobs or apprenticeships. The investigators state that it is neither economic pressure nor inability to appreciate the studies which drives most of the pupils from school at fourteen, but from the few facts they publish there is ground for doubting their conclusions, except in the middle social classes—economically speaking. Few laboring men are able to support their children until 16, indeed the vast majority of men cannot support more than three babies until fourteen. Not only must each tot do its share of house or farm work, but it must add to the family income as soon as possible. There are ugly rumors of suppressed reports of the Sage Foundation which show that ten percent of public school children go to school hungry, and that 75 per cent of juvenile crime is the result of poverty. These rumors are in strict accord with what always has been found in such investigations—that is, some men cannot earn enough to feed any babies, and that most children must earn some subsistence at the very first practicable moment. Few can support their children until 21, and only the exceptional man can send his boys to technical school until 25.

**Badly Nourished School Children.**—Dr. Henry H. Goddard is reported to have found that two per cent. of public school children are actually feeble-minded, and it is unquestionably due in large part to undernutrition, which prevents brain growth. The facts published also show that most children at 14 realize that scholarship is beyond their

reach and they instinctively quit. Then there are the profound changes of puberty, which disable the children temporarily. The brain is sluggish because growing tissues take all the nutrition. It is a time for mental rest and dreaming. This no doubt forces many a child into mental idleness who would return to books afterwards, but it is a minor factor compared to the others. The Vocational Survey merely shows that we must do the best we can with poor children until they are fourteen, and then let them work two years at anything wholesome until they are able physically and mentally to become apprentices in industry or commerce. When this apprenticeship begins is the time and opportunity to organize the half-time industrial schools as recommended by Dean Herman Schneider of the University of Cincinnati, where the system has proved that such boys make more progress in school than the full-timers and more progress in shop than the old-time apprentice. Night schools fail because working boys are too tired, and should be in bed, while the industrial full-time schools for boys between 14 and 16 can be utilized only by those whose parents can support them—the others must work at something gainful at least half-time. We are strongly of the opinion that those who employ children can be induced to so arrange the work that each boy can attend school two or three hours daily. Where large numbers are employed private schools have been established on the premises with the greatest success. There is no reason why part-time in school should not be made compulsory, and if the work is wholesome perhaps we might allow children of 12 or even 10 to do something for wages, like we all did on the farms a generation or two back. But sad experi-

ence shows that employers cannot always be trusted and it will be necessary to have all workers less than 16 under the strictest supervision, in the same way but in greater detail than the present factory inspections.

**The compensatory nature of high blood pressure** is an idea to which clinicians must give more heed than they have in the past. Indeed all the accepted theories of the relation between arterio-sclerosis, cardiac hypertrophy, interstitial nephritis, high blood pressure, and protein poisons, are sadly in need of revision. We have long abandoned the idea that alcohol was the main cause of hard arteries for that poison is relaxing, so we turned to excessive exertion or auto-intoxication of defective digestion as the main causes of the high blood pressure on which arteriosclerosis was supposed to depend. It is certainly astonishing how large a proportion of cases do have a history of hard labor or indigestion, but it is equally notable how many hard workers or dyspeptics escape. The condition is not infrequently the cause of death of sedentary men who have led sedentary lives, so we must seek other causes. We may have to fall back on the old, old theory that some of us are so poorly fed in childhood that our tubing is of poor material and hardens under the normal stresses of life, and that high pressure is a compensation to force blood into areas which would otherwise be ischaemic. On this theory the cardiac hypertrophy is a resulting compensation, while the nephritis is merely part of the primary arterio-sclerosis,—the whole process being unpreventable results of defective development. The picture is certainly seen in degenerates more often than in the normal.



## MEN AND THINGS



**A Great Surgeon.**—The sudden death by heart disease of Dr. Roswell Park at his home in Buffalo, Feb. 15, 1914, was a great shock to the medical profession. He was one of the leading surgeons of the world whose contributions to medical literature have had great influence in the past and will make a permanent impress on medical thought. He was one of the surgeons in attendance on President McKinley after the shooting

by the despicable anarchist in September, 1901. He was Professor of Surgery in the University of Buffalo, Surgeon to the Buffalo General Hospital, Director of the New York State Cancer Laboratory, trustee of the Buffalo State Hospital, and a member of the Philharmonic Society, the German, French and Italian Surgical Associations, the International Society of Surgery, the American Surgical Association, and the Medical Society of New York.

He was born in Pomfret, Conn., on May 4, 1852, the son of a clergyman. Both his father and mother, Mary Brewster Baldwin Park, were descendants of distinguished American families, one member, Col. James Baldwin, having been a member of the staff of Gen. Washington, who was with the army at the crossing of the Delaware.

Dr. Park received his medical education at Racine College, Wisconsin, and Northwestern University, and received degrees from Lake Forest University, Harvard and Yale. After serving as interne in various hospitals he was appointed demonstrator of anatomy in the Woman's Medical College, Chicago, 1877.



In 1879 he became Adjunct Professor of Anatomy in the Chicago Medical College, where he remained until 1882; then Professor of Surgery in Rush Medical College, and in the medical department of Northwestern University. He studied surgery in several large European hospitals and went to the Buffalo institutions in 1883. He was Surgeon of the Fourth Brigade, N. G., N. Y., 1884-93, and President of the Spencer Lens Company. He was the first surgeon here to establish a private bacteriological laboratory. The Congress of German Surgeons elected him a member in 1887.

For some years he edited *The Weekly Medical Review*, was associate editor of "The Annals of Surgery," and editor of *The Medical Press* of Western New York. Among his writings were "Park's Modern Surgery," "The Electric Light in Surgical Diagnosis," "Contributions to Abdominal Surgery," "A Radical Cure for Hernia," and "A History of Medicine."

**The effect of athletic sports on the heart.**—Dr. C. R. Bardeen of Madison, Wis., states that the increasing amount of cardiovascular disease noted in this country by life insurance companies and others makes it important for the physician to make himself acquainted with the chief causes responsible for these conditions so that he can protect his patients. Overexertion in competitive sports, especially in school boys, is one factor. From 5 to 10 per cent of freshmen entering the state university have cardiac hypertrophy with dilatation attributable to athletic sports. While in most cases there is good compensation, in many there are mitral murmurs and a myocardial irritability which not only keeps these students out of college sports but to some extent hampers their scholastic work in college. Practically all college students

taking part in the major sports have hypertrophied hearts. While in many cases compensation is good, in a large number there is a myocardiac irritability sometimes accompanied by mitral murmurs which indicate somewhat serious lesions. In the past two years there have in addition been four cases of acute cardiac dilatation among the relatively few members of teams in the major sports to one case among the far greater number of students not members of teams. In the latter case the dilatation occurred while the student was running in the gymnasium. (*Critic and Guide*, Jan., 1914.)

The above facts are a dreadful indictment of sports which cause undue strain. Nevertheless we must make some allowance for the effect of the high and dry climate to which our physique is not adapted. Similar investigations made in Johannesburg, South Africa, by the Health Officers showed that 63 per cent of school children had abnormal hearts. As they were too young to have indulged in heart straining exercises, the damage was thought to be due to the blood changes caused by high altitudes i. e. increase of red blood cells, greater viscosity of the blood, more arterial friction, compensatory hypertrophy with later dilatation and the usual syndrome of this condition.

**The Supply of Radium.**—The nationalization of radium has been suggested by Prof. Frederick Soddy, the physicist, and Sir Alfred Gould, the cancer specialist of London. It is pointed out that while Austria and the United States have minerals from which radium can be obtained, and Germany mesothorium, the whole wide domain of the British Empire has neither as far as known. The Radium Institute has but four milligrams valued at £330,000, but needs 500 milligrams for the treatment of cases in sight. The cost is prohibitive for private enterprise, and competition among cancer sufferers will only raise prices. The amazing success in some cases, even after only one short exposure from a little radium in a tube imbedded in the tumor, makes it incumbent upon us to use the remedy in every case which cannot be eradicated by surgical means. Of course some cancers disappear mysteriously—probably from some similar effect of other causes, but that

does not indicate that the radium is not the cause in these therapeutic cures. There are many unaccountable failures and part failures, but these will not lessen the obligation to employ it in appropriate cases. It seems to offer more hope than any other system by serums or what not, now under investigation.

The only practical course is for society to buy it and let everyone use it for a fee equal to the interest on the cost plus the expenses of management. There is no deterioration, and the tubes can be kept in use 24 hours a day by proper management. It is even suggested that its use be free, and the costs defrayed by taxing the healthy as well as the sick. It is curious how quickly we are drifting to the socialistic condition of public ownership of the means of curing the sick. The states and municipalities in the United States might consider the matter, as it is too big a job for the general Government at present.

**The dangers of radium** have been known ever since Prof. and Madame Curie announced its discovery to the world. Its powerful rays had been found to destroy life or modify growth in a most amazing way. It was known to cause deep intractable ulcers in the skin by an exposure of several hours. In spite of all this knowledge the nurses at the Radium Institute in London have been handling it with an utter recklessness which indicates ignorance of possible harm. Almost everyone in the institution has been injured—the nurses who handle the material being the worst sufferers. The effects are not noticed for a couple of weeks, when the skin peels off painlessly as after sunburn, the finger nails become brittle and split down the center, ulcers appear and the hands become totally anesthetic, but very susceptible to heat or cold. As the rays penetrate the ordinary materials, it is useless to wear gloves which protect from X-ray, and the sufferers are compelled to give up the work. All this reminds one of the early history of X-rays, and we must be prepared for the announcement that cancers are appearing on the hands of those who have been the most reckless. In treatment, the rays injure the abnormal cells first, but in time will destroy the normal, so we must expect to hear of

ill results of overtreatment. It is therefore time to utter a warning to the public against the too optimistic tone of the popular articles which have been appearing. Not only does the treatment unaccountably fail in many cases, or partly fail as above mentioned, but there are also relapses reported, and we are not informed of the ultimate fate of many of the old cases. One man has been quoted as stating it to be a sure cure whereas he is not at all certain as to the results. The whole subject is too new, and while we would be criminal to neglect it, we must not raise false hopes. There is no justification for the present hysterical praise in the lay press, and it must not be made a mystical fad, a course which has wrecked many another promising method.

**Accidental poisoning by corrosive sublimate** continues to increase in spite of the fact that the dangers are more widely recognized than ever before. No doubt some cases which formerly were unnoticed by the daily press or given scant space are now featured, as the subject is of greater public interest, but after making due allowance for greater publicity, careful observers are quite convinced that the accident has become alarmingly frequent. It does seem that family physicians might do much towards eliminating this great danger. The presence of the drug in so many households is due to a use the discussion of which cannot go through the mails, so the prevention of the fatalities must be by verbal instruction. It is justifiable to say here that there is rarely if ever any adequate reason for the presence of this deadly chemical in any household. When antiseptics or disinfectants are needed in the home, less dangerous ones should be chosen. The great evil lies in the almost universal habit of storing poisons in the medicine closet with remedies intended for internal use. When crystalline laxative salts were popular, oxalic acid poisoning was not uncommon, because they were kept together. It might be well for the family physician to take a look into the medicine closets of his patients and give a warning if he finds any dangerous chemicals, which should be thrown away or stored elsewhere. Most of the acci-

dents are due to the pernicious habit of self-dosing, and we do not see how that can be prevented, as it is as old as mankind itself. In years past a great many suggestions have been made as to keeping all poisons in specially shaped and labeled receptacles, and poisonous tablets of special shape to distinguish them from the round ones for internal use. We hope our pharmacists will settle upon forms which will become universal and standard. In the meantime the daily press should continue to give publicity to these cases, so that the danger will be impressed upon everyone. There need be no fear of an increase of suicides, though persons with that mania will unquestionably resort to the better known corrosive sublimate instead of other ways of ending their existence. But if we keep all poisons out of our houses, we will have few if any cases of deliberate or accidental death from corrosive sublimate.

**Eye Troubles Caused by Motion Pictures.**—Hart (*Knowledge and Scientific News*) says that the ocular disturbances due to the cinematograph have received practically no mention in medical literature; which seems strange, as no doubt every oculist, especially in the larger cities, has tested many patients suffering from this new disease. He points out that a period of motion is lost between each successive picture in the short period the lens are closed to admit of the successive section of film being brought into place behind the lens, and says that although the eye does not realize that motion is lost, yet it still has an impression of lack of continuity; from this inflammation of the conjunctiva with its attendant symptoms of lachrymation and photophobia may occur and also very definite asthenopic symptoms, both accommodative and retinal—the former due to the ciliary strain and the latter due to a hyperesthesia of the retina. To minimize the production of these results the films should be perfect, the illumination steady, the speed at which the machine is run, regular, and the position of the spectator, facing the screen—never at the side of the auditorium and not nearer than twenty feet from the screen.



## "ARE ODORS AND EFFLUVIA DANGEROUS TO HEALTH?" A STUDY IN VENTILATION.

BY

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**Introductory Note.**—The careful student of ventilation soon learns that the subject is far from being a science, that there is much material that comes under the term "theory," more properly "conjecture," and little that comes under the precise term "fact."

So many problems must be settled before the correct standard can be discovered and so little, comparatively, has been done to accurately determine the underlying principles of this standard that we are hardly beyond the threshold of progress.

The writer, who spent one collegiate year studying the effects of carbon dioxide in inspired air on health, was able to devote but little time to an investigation of the ill effects of odors and effluvia upon the subjects who presented themselves for experimental purposes.

The following constitutes a brief report on this special study:

When entering a room where the air is close the first two impressions are the unpleasant warmth and the disagreeable odor. Those occupying the room are not aware of the smell although they may be suffering from the warmth. Is the smell dangerous in

itself? or is it a danger signal? or is it mostly noticed because it is unusual?

These questions we are not able to answer satisfactorily nor have we time to make an extended study of the subject. We refer to it in passing because it is so apparent, so unpleasant, so often mentioned, and may possibly be dangerous.

The personal equation or the esthetic sense may be such that the odor is not noticed, or if so, not distasteful.

Strong smelling cheese, "high meats," do not bother a special class of epicures; the smells from soap and glue factories and rendering establishments do not long annoy the workers, moreover these persons seem to be perfectly healthy.

The odors, however, from a close, "stuffy" room are disagreeable and in the absence of positive proof that they are not dangerous, it is well to place them in the suspected list and either avoid or prevent them.

Our studies in close rooms where the air is vitiated have been with subjects who are either college graduates or doctors of medicine, all of whom are given to cleanliness. When an odor was noticeable we were able to trace it to paint, warm rubber, steam, etc. An object, whether connected with human or inanimate beings that is foul smelling will still be "foul as Vulcan's Stithy," and should be removed. We therefore suggest that cleanliness be taught with every lesson on pure air.

In a room the air of which is at first perfectly pure but is later vitiated by respiration, the smell of organic matter is generally perceptible when the CO<sub>2</sub> reaches 7 parts in 10,000 volumes and is very strong when the CO<sub>2</sub> amounts to 1 part per 1,000 volumes.

We have taken some pains to collect the opinions of a number of scientific men who have made a careful study of the problem of ventilation. A few of the excerpts are here presented.

Parks and Kenwood (*Hygiene*) page 167:

"It is possible that the deleterious action of air vitiated by the presence of human beings is to some extent due to the presence of human odoriferous volatile substances, minute in amount though they be, that the action of these volatile particles may ultimately induce, through the central nervous system, alterations in respiration, circulation and nutrition which are inconsistent with the maintenance of health."

Macfie (*Air and Health*) page 130, says:

"Air containing merely the CO<sub>2</sub> and moisture usually contained in vitiated air will not produce the effects of vitiated air, and vitiated air, therefore, must contain an additional constituent. The additional constituent though undetected by chemists is probably detected by the nose for it is well known that air is oppressive and harmful not so much in proportion to the CO<sub>2</sub> and moisture it contains as in proportion to its smelliness. The relation between organic effluvia and the healthful performance of physiological function is so close that a bad smell may cause nausea and faintness. The very fact that the nose is so sensitive to such odors seems to suggest their harmfulness."

What the nature of these malodorous substances may be is obscure, but they are probably manifold in character, and we suggest that they originate chiefly from the skin. DeChaumot, examining the air of barracks, stated that an unpleasant smell becomes perceptible as soon as the carbonic acid was 2 volumes per 10,000 above that in the outside air, and Haldane and Os-

borne remark "in rooms where the standard of personal cleanliness is higher the excess may in our experience considerably exceed the 2 volumes without any unpleasant smell being perceptible."

In 1900, Formanek gave an extended review of the work of the allied subject of the poisonous elements of respired air. He emphasized his belief that decayed teeth and decomposing material in the mouth are the chief source of ammonium chloride in the breath. He believes these conditions are sufficient to account for the toxic elements which other investigators have discovered in the breath.

Haldane (*British Documents*) says:

"Air in a perfectly air tight room containing one person at work to every 250 c. f. of space would contain 40 parts in 10,000 of CO<sub>2</sub> at the end of an hour and would smell very unpleasantly. At the end of eight hours the air would be so foul that candles or lamps would no longer burn. Everything would be damp from condensed H<sub>2</sub>O (candles extinguished when O<sub>2</sub> falls below 17.5%). More or less panting would be noticeably present, most would have nausea and headache."

Benedict, (*Bulletin 175, Carnegie Inst.*, page 243) says:

"On opening the window of the chamber after an experiment the air inside invariably smells 'close' to an outsider, yet it is unnoticed by the subject himself."

A. E. Boycott (*British Documents*, 1909, No. 7, page 222) says:

"Apart from the smell the essential difference between a 'fresh' and a 'stuffy' room is that in the former the air is not all at the same temperature but is broken up by draughts which impinge on the hands and face, lower the skin temperature and so produce a feeling of liveliness. The qualities of freshness and stuffiness in a building, and in consequence the energy or slackness of the inhabitants, has nothing to do with the content of the air in CO<sub>2</sub> as such. Cold air free from unpleasant smell but containing 3% of CO<sub>2</sub> I have found to be a distinctly invigorating mixture."

Prof. Theodore Hough (*The Physiological Aspects of Ventilation, Am. Jour. Pub. Hyg.*, 1910, page 262) describes an experiment in which a person was confined in an airtight box with the dimensions of 3 by 5 by 7 feet. He says:

"The percentage of carbon dioxide rose to 50 parts or more in ten thousand. When the observer opened the door the odor of the air within was almost overpowering; and yet, provided the water vapor was absorbed and the temperature of the box kept down the subject of the experiment had not only been unconscious of this odor but had actually suffered no discomfort."

Haldane and Smith (*Jour. Path. and Bact.*, 1892-3, page 186) say:

"Some important practical deductions may be derived from the first of these results. If there be no special poison in air viviated by respiration, it would seem to follow that (apart from the effects of heat and moisture, and of infection caused by bacteria) the air of ordinary closed rooms is only injurious in so far as it is offensive to the sense of smell. Now the smell in such rooms can often be more easily got rid of by other means than excessive ventilation. The supposed existence of an odoreless volatile poison in respired air has led to the belief that excessive ventilation is in itself necessary, and that cleanliness is probably of less real importance."

If, however, the deleterious effects are produced through the nerves of smell, it is evident that in order to secure wholesome air, efforts must rather be concentrated on the prevention of smell than on the mere dilution of the products of respiration. This deduction becomes still more important in view of the fact referred to at the beginning of this paper that dilution by ordinary ventilation is not an effective means of keeping the air of rooms free from bacteria."

Dr. Leonard Hill (*British Documents*, No. 7) says regarding smells:

"The ill effects of crowded rooms are due to the heat and humidity, and nervous fatigue from excessive illumination and excitement, not to increase of CO<sub>2</sub>. I think it is very doubtful if unpleasant smelling ex-

halations of the bodies of men which become evident in close atmospheres have any ill effects on men not accustomed to them and not of aesthetic temperament."

Mitchel, Billings and Bergey (*Smithsonian Contribution*, Vol. 29, No. 989):

"The discomfort produced by crowded, ill ventilated rooms in persons not accustomed to them is not due to excess of carbon dioxide nor to bacteria, nor in most cases to dusts of any kind. The two great causes of discomfort though not the only ones are excessive temperature and unpleasant odors."

Flugge (*Zeit. f. Hyg.* 49—1905, page 363) says:

"From the unpleasant smells present in dwelling rooms, which result chiefly from the decomposition of matter on the skin and mucous membrane and also on the clothes of the persons present, no injurious effect on health has been demonstrated. Nevertheless, these smells cause a feeling of nausea on entering the room and from a practical point of view should be obviated."

**Conclusions.**—In most cases there is an unpleasant odor in rooms where the air is viviated.

There is little evidence that the foul odor, *per se*, is inimical to health.

A bad odor, while not dangerous in itself, is yet an index of noxious conditions and should be eliminated as soon as possible.

Agitating the air in confined spaces will help dispel the odor.

## THE HOUSE AS A FACTOR IN THE EVOLUTION OF TUBERCULOSIS.

BY

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It would almost seem at times that the very obviousness of an evil served to blind men from recognizing its presence. Perhaps

the best contribution which Dr. Charles V. Chapin of Providence has made to the prevention of the spread of tuberculosis is his challenge to the public health world to justify the emphasis placed upon terminal disinfection. Habit is a wonderfully well woven mental attitude. Imitation alone successfully competes with it for supremacy as

isolation of a case through quarantine and by disinfection of the premises afterwards. In these days of germs and common carriers a perfect quarantine cannot be established, while the porosity of the average slum house makes any attempted thorough disinfection merely a form.

Tuberculosis is pre-eminently a disease



119 Carpenter St.—A typical old house—one of many in a similar condition in its neighborhood. Many without cellars. Occupied by families with many children. Leaky roofs and sides—damp floors. Clammy cold in winter.

a factor in the perpetuation of a practice. The insistence upon disinfection for contagious diseases may or may not be justifiable but the fact of the insistence has done much to blind public health officials to the causes that spread and perpetuate such diseases. It has often postponed a study into the causes for the prevalence of filth diseases by raising a false sense of security in the

that thrives in a badly ventilated, inadequately lighted, damp, grossly unsanitary house. It spreads where bad housekeeping and occupancy evils flourish. Overcrowding gives it the proximity that makes its passage from person to person easy. Somehow the extent to which these defects have produced new cases and militated the cure of old cases has not been agitated

by those interested in the prevention of tuberculosis. The emphasis has been upon the isolation of advanced cases, the forced feeding of incipient cases, out-door treatment, sanatoria, the prevention of spitting in public places and similar projects almost

house is normally clean and wholesome the patient has a chance to retain the improvement which his arrested case promises but if the house is sub-normal there is absolutely no chance for the patient. He ultimately returns to the dispensary, hospital



Narrow street—surface drainage—dense population—small yards—open privy vaults—  
rear houses.

all worthy and undoubtedly a necessary part of any general program but not in themselves complete. Influencing every discharged case from a sanatorium is the house and its environment from which the patient came and back to which he goes. If the

or sanatorium, or goes into a decline.

As tuberculosis is a germ disease one must, in order to trace its evolution, in addition to other sources external to the tubercular person, note the presence in the house of the following:

**1. Carriers and Liberators of the Germs.****A. The individual:**

Coughing,  
Sneezing,  
Spitting,  
Personal practices such as kissing.  
Common dining service, drinking cups, etc.,  
Overcrowding and occupancy evils.

**B. Germs:**

Liberated in 24 hours—Cornet's estimate—7,000,000,000 a day.

**C. Dust:**

Floating in the air,  
Shuffling feet,  
Sweeping.

**D. Creeping and Crawling Things:**

Laden with dust, passing through cracks from apartment to apartment and house to house and coming in contact with food and milk.

**2. Retention of Germs—**

*Probable life of germs on or in connection with*

Furniture,  
Clothing,  
Bedding,  
Refuse,  
Filth,  
Floor,  
Walls and Wallpaper,  
Inadequate light,  
Inadequate ventilation.

**3. Methods of Transmission.**

Inhalation,  
Foodstuffs,  
Wounds,  
Personal contact.

**4. Receptive Character of the Prospective Victim.**

*Weakened vitality due to*  
Personal habits,  
Poor nourishment,

Inherited debility,  
Unwholesome trades,  
Lack of exercise,  
High temperature and humidity in living rooms,  
Insanitation,  
Lack of fresh air,  
Lack of sunlight,  
Dampness of dwelling.

A perusal of these relationships does not preclude the possibility of the patient being outside the house and, by methods as outlined, passing his disease to another whose vitality makes him susceptible to the inroads of any contagion. Admitting, however, the possibility of such, no information of any great reliability has been forthcoming, nor can it be, to show the percentage of cases thus transmitted. While the probability is reasonably certain that a given percentage of cases owe their origin to tubercular patients frequenting public places and using public conveyances, nevertheless, such persons spend the major portion of their time within the home. If this home is well built, well lighted, ventilated, cleansed, and the patient is discreet in his actions, and place of sleeping, the part the house plays is very much minimized. But, on the other hand, if the house is poorly lighted, ill-ventilated, is old, ramshackled and unsanitary, it becomes a very dangerous factor in the spread and furtherance of the disease. Note the possibilities here. Cornet states one patient liberates approximately 7,000,000,000 germs daily. Carrington states that these same germs live within a room from two to two and a half months. Experiments have shown that their period of life is greatly extended even for years when they are resident in darkened corners or concealed by papering upon the walls of a foul surfaced tenement. Granted then the combination

nation of circumstances that brings the susceptible person to the just vacated subnormal house and the strong likelihood of another victim is a reasonable deduction.

Interesting and pertinent data have been collected by various students that throw

when the rate for females, unlike that for males, in the rural districts was contrasted with the rate for cities it was found to be practically the same, so slight was the difference. As Notter and Firth point out the real significance of this data lies in the fact



Rooms so dark midday that lamps are lighted. Olivet Place. 3 ft. 6 to 4 ft. wide. 5 houses facing high wall. Windows on alley side only. 1912. Rooms damp.

some light on the fact of the effect of the house though not on the manner of the influence. For example, the Register General for England, in a report published some years ago, declared that the urban death rate for tuberculosis exceeded the rural, yet

that in the rural districts home insanitation is prevalent and the women spend much more of their day within doors than do the men. Dr. Tangee, speaking recently of the health conditions of Warwickshire, brought out the illuminating information

that though the general decrease in the rate for England and Wales for the past 20 years approximated 30% yet in his district, made up of 71,000 people, largely rural, the tuberculosis rate had remained practically the same. His deduction is that the agricultural laborer, despite the sanitary advance made during the past generation, has been held back because of the insanitary condition of his home, an insanitary condition, by the way, due to an inadequate supply of homes and the consequent enforced occupancy of dwellings otherwise unfit for habitation. He states: "The majority of phthisis cases visited have been found to be under conditions of dampness, bad ventilation, or overcrowding, which undoubtedly have predisposed to infection." Cornet's analysis of the effect of cloister life and Baer's studies of the tuberculosis rate in prisons, cited by Osler to strengthen his exposition of the influence of depleted and impure air and low vital resistance in combination with the tubercular bacilli, further illustrate the ill effect of the combination of conditions so often found in slum homes.

Not only within the house proper are the negative health results produced but often the environment has its reflex upon vitality. Data covering varying periods and taken at different times for a number of years bring out the consequences of back-to-back house occupancy. The notorious evil of such construction of course is the absence of sunlight for the rooms and the surroundings and the impossibility of through ventilation clearing away the foul air within and about dwellings. The high death rate from tuberculosis in certain alley houses of Washington, 2,222 per 100,000, in 1912, is duplicated in the reports of Drs. Tatham and Jones in the Salford and Shipley districts. The study by Dr. Tatham showed that in the

years when the rate in the area of no back-to-back houses in Salford was 2.7 per thousand and areas having 50% of the houses back-to-back had a rate of 4.5 per 1,000. The study by Dr. Jones revealed that in Shipley when the rate for the community was 2.3 per 1,000 the rate for back-to-back houses on streets 75 feet wide was 2.8 per 1,000, while the rate for similar houses on streets only 30 feet wide was 4.6 per 1,000. The value of this data is enhanced when it is remembered that Dr. Jones states the districts mentioned were side by side and "The houses were built at the same period of time, of the same material, they were occupied by the same class of people, working at the same industries, the sanitary arrangements were the same, the aspects of the houses the same, the heights above the sea level the same, and the houses were occupied during the entire period of study. The only difference between the groups was that in one case they were through houses and in the other case they were back-to-back." It will thus be seen that neither the kind of trade nor the economic status of the employees had as great an influence on the difference in the rate as the impossibility of adequate ventilation and the increased congestion of living.

Data partially illuminating are also at hand to show the effect of land overcrowding upon the tubercular patient. When the rate for London was 1.44 per 1,000, that for the slum at Bermondsey was 6.10. In a more intensive way this same dire result is shown when the congestion is not of people per land but of people per room. In Finsbury the rate for phthisis for 3 room apartments was only 1.4 per 1,000, while in the one room apartments it averaged 3.4 per 1,000.

It would seem from the foregoing that tuberculosis is more fatal in the areas where sanitary conditions are below normal and where occupancy evils are acute. The studies of Buchanan and Bowditch further strengthen the postulate that there is a causal relationship between deaths from phthisis and dampness in and about dwell-

of tubercular deaths was made by Dr. Flick in the 5th Ward in Philadelphia. This has lately been brought down to date by Dr. Craig, giving a record covering a period of 47 years. It is illuminating in that it clearly points out a high percentage of deaths in houses previously occupied by tubercular patients. It will be recalled that



Room overcrowding. 35 rooms in as many houses were found in a similar condition of occupancy. Such room overcrowding attendant as it is with poor light and inadequate ventilation is a prolific aid to the spread of all sorts of contagion. Here a day and night shift of boarders used the rooms. In some 3-room houses where the floor area does not exceed 120 sq. feet per room as many as 22 roomers were found. One had 40 roomers. Many average 15 per house, in 2 rooms of a tenement.

ings, wet cellars, stagnant pools and foul drains, dilapidated and filthy buildings, while the report of the Paris Housing Commission definitely ties down the larger number of deaths investigated by them to certain definite and undoubtedly infected houses.

What is perhaps the most extensive and thorough American study of the locality

Dr. Flick's personal studies for the year 1888 revealed 50% of the deaths that year were from houses that during the previous generation had had one or more deaths from this disease. Dr. Craig, following this record up, discovered that of the 1,676 houses studied about 78% had, during the entire period of observation, one or more

deaths. In 62 houses the deaths averaged 3 or more per house. Out of 2,248 deaths in all, 252 or 11.2% occurred in 4.7% of the houses. Dr. Craig further isolates the deaths occurring in a minimum number of houses by a more intense study of the deaths following each other within a period of four years, which he figures is a legitimate period of possible communicable relationship. His figures here (See 7th Report of the Henry Phipps Institute) show that "15.7% of all deaths in 47 years were possibly due to house infection." His study among children showed that 28.6% of tubercular deaths occurred in houses where there had been a death within the preceding four years.

The foregoing is a logical argument from the consequence back to the predominating influences that produced it, but there is another way to establish the causal relationship between the house and the mortality from tuberculosis. In practically every area where slum clearance has been effected, where old houses have been removed and new buildings erected, equipped so as to secure adequate provisions for light, air and drainage, and supervised so as to control overcrowding and similar occupancy evils, there has been a decided reduction in the tubercular death rate. One instance only need be cited here, namely, Liverpool. A slum near the wharves was cleared away, 2,663 houses were built, 70% of the old population were rehoused, the average wage was not over 15 shillings per week yet the number of deaths from phthisis dropped from 4.0 per 1,000 to 1.9.

Indicative as the foregoing is in pointing the effect of insanitation upon tubercular patients yet it does not prove that the incidence of this disease is in bad housing. It does point, almost beyond con-

troversy, to the risk run by a tubercular patient who resides in an area of insanitation and to the possibility of contamination to non-infected inhabitants through bad housekeeping and the promiscuous relationships established between people in such subnormal areas. Perhaps it is unnecessary to indicate more than that deaths come more frequently and with greater speed to the afflicted who live in slum houses in town or city. On such a ground is one who works to check the ravages of this disease justified in waging a campaign against the slum as a chief menace in the control of tuberculosis.

It is therefore safe to assume that the influences that hasten death among the infected likewise undermine health and encourage phthisis among the strong. The combination of circumstances being present, the result is practically inevitable. Coates has shown statistically the greater numerical strength of virulent bacilli in a dirty house than in a clean one when both are occupied by patients in the same stage of the disease. His proportion is approximately 66% to 50%,—an appreciable difference when the number of bacilli given off by an advanced patient each day is taken into consideration. Given the situation, the house filthy, the environment insanitary, light and ventilation shut away, the demised tubercular patient, the longevity of the bacilli, the new tenant as often as not below par physically, and the result is inevitable. The Philadelphia Housing Commission in 1912, in order to ascertain whether some provisions of a proposed housing code were too drastic in their delegation of powers to the health authorities to vacate and condemn unfit buildings, collected statistics relative to the frequency of repetition of new cases of tuberculosis in dwellings and tenements. It discarded all

records of deaths and concerned itself simply with new cases. To eliminate the element of personal contact as much as possible it omitted cases where a second victim came from the same family. The area chosen for study comprised the Delaware River wards in the older sections of the city where back-to-back houses are numerous, where from 30% to 50% of the houses

five each; 1 reported 6 cases; 2 reported 7; 2 reported 8; 1 reported 9, and 1 reported 14. The last 7 houses were classed as rooming houses of a type more common to Philadelphia than to any other American city, where single rooms are rented, furnished and unfurnished, to families, in some instances to be shared by boarders. Near the close of the investigation a house was re-



Cellar sleeping room 6' 8" high, 14' long, ceiling 17" above sidewalk level but even with yard level. Water seeps through foundation causing the room to be constantly damp.

have no street frontage, where one-room apartments and furnished room houses abound, where drainage is bad and nuisance conditions abound. The study was of five years records of new cases amplified by a house to house inspection. 30 houses were found, from each of which 3 cases of tuberculosis from as many different families had been reported during the period; 12 other houses reported 4 cases in each; 2 reported

ported outside this general district where within one year the dispensary records showed it had revealed 3 cases of tuberculosis with one resulting in death, one case of scarlet fever, one of diphtheria and one of pneumonia. As every one who deals in any way with public health records knows, the total number of cases reported always falls short of the actual number of cases occurring. It is probable, therefore, that

the number of houses with a record of at least 3 cases is greater than the number here given. Knowing the houses and their environment there can be but one conclusion drawn as to their probable infected character.

Without going into any detailed statement of the treatment of houses when they have been found to produce repeatedly cases of tuberculosis, it would, nevertheless, seem desirable that those working for the eradication of this disease should have a housings used for human habitation.

1. Requirements for sanitary surroundings to all homes.

2. The elimination of dust-producing and like treacherous trades from all buildings used for human habitation.

3. The prevention of room overcrowding and building congestion.

4. Frequent and thorough disinfection of all rooms used continuously by tubercular patients, not only after the patient has been removed but periodically, while he is still making use of the rooms. This disinfection should include the removal of all paper from the walls and the substitution of paint or other washable surfacing.

In addition to the foregoing, every case of tuberculosis should:

1. Be registered soon after its inception and no person suffering from it in any form should be allowed to move to another house without first obtaining a permit from the health authorities.

2. All such patients should be obliged to move from houses where sunlight and good ventilation are shut off, from all buildings where sanitation is below normal, from all old tenements and rooming houses.

3. There should be an enforced vacation and condemnation of buildings unfit, by reason of age, or of insanitary conditions

within the structure of the building, until they have been satisfactorily cleansed or reconstructed and made fit.

Until these precautions are taken, the anti-tuberculosis campaign will fail to reap results commensurate with the amount of money contributed for its use.

## CHRONIC TOBACCO POISONING AND THE CIRCULATION.<sup>1</sup>

BY

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The following observations on the effects of chronic tobacco poisoning on the circulation establish no positive pathological conclusions, but they seem to be suggestive, and that is the excuse for their presentation.

A man twenty-five years old, a physician, who was a steady smoker of cigarettes, awoke one morning feeling so weak that he did not care to get out of bed. I found him with a very feeble heart action, and a blood pressure, as estimated by the finger, very low, and a pulse rate ranging between fifty and sixty. After rest in bed for two days and abstention from tobacco his heart action came back to its normal.

A man fifty-four years old, an administrator, who was an excessive smoker, awoke one morning with the same symptoms as those of the patient just mentioned, and a pulse rate of fifty-two. The same treatment as that given in the other case produced in him the same result.

<sup>1</sup>Read before the Brooklyn Society of Internal Medicine, Dec. 26, 1913.  
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A man thirty-five years old, a journalist, with good general health, and no previous morbid history of significance, but who had smoked more or less ever since the age of eighteen and rather more than less, came under my observation with the following history: At different times during the preceding year or two, after unusually heavy smoking, he felt an uneasy sensation and a dull pain in the precordium just beneath the left nipple. Sometimes he felt short of breath after a cold plunge or a very cold shower bath. On one occasion, after carrying a heavy weight up a flight of stairs, he suffered for several hours from cardiac oppression, a dull pain in the precordium and shortness of breath. During the past year he did a large amount of brain work and had taken rather less out of door exercise than was his custom. Lately the cardiac uneasiness and dull pain in the precordium occurred more often than formerly, which induced him to lessen considerably the amount of his smoking.

Physical examination showed him to be well nourished and of a healthy appearance. Skin warm and ruddy, which is habitual with him, as well as facile perspiration. Slight enlargement of heart, left border extending to mid-clavicular line. Heart sounds soft but clear. Heart action slow and slightly irregular both in force and rhythm. Blood pressure, 115 systolic, 60 diastolic.

Immediately after the observation of his blood pressure above recorded was made, he smoked a pipe, and fifteen minutes later his blood pressure was 115 systolic, 70 diastolic, showing that the single smoke had no effect on his systolic pressure, but caused a rise of 10 millimeters in his diastolic pressure. On three different occasions similar

effects of a single smoke on his blood pressure were observed.

During the next two months the systolic blood pressure in this case, as observed, ranged between 85 and 110, being most of the time about 100, and the diastolic pressure ranged between 60 and 75. The pulse rate was usually between 50 and 65. The pulse pressure ranged between 20 and 50 being most of the time between 30 and 40. Only once was the pulse pressure found to be as small as 20, which was below the limit of efficient circulation, and this occurred when the systolic pressure was 85.

After two months his blood pressure began to rise so that the systolic record was often between 115 and 125, although the diastolic record was usually found rather low, between 65 and 75; and his pulse rate rose to between 60 and 70.

Six months after he first came under observation, when he was feeling very well, and showed a systolic blood pressure of 125, a diastolic pressure of 65, and a pulse rate of 60, I tested his myocardium by causing him to run briskly around a room for half a minute. His blood pressure taken immediately after this exercise was, 115 systolic and 55 diastolic, and his pulse rate was 68. The exercise caused both his systolic and diastolic pressures to fall 10 millimeters, while his pulse rate showed a slight rise.

The study of the blood pressure in this last case brings out the following facts: 1. The systolic blood pressure was generally lowest when the subjective cardiac symptoms of chronic tobacco poisoning were most pronounced. 2. The pulse pressure was generally smaller when his subjective symptoms were pronounced than it was when they were not. 3. A single smoke

raised the diastolic pressure but did not raise the systolic pressure. 4. Brisk exercise caused a uniform fall in both the systolic and diastolic pressures.

It is interesting to compare with the observations last mentioned the following observations on a man forty-one years old, a physician, in good general health, who smoked tobacco, mostly in the form of cigarettes, since the age of eleven, and for many years to excess, averaging, he thinks, at least fifteen cigarettes daily. This man experienced no symptoms of cardiac disturbance at any time. Examination of his blood pressure showed it to be low, but with a large pulse pressure, viz.: 105 systolic and 55 diastolic. His pulse rate was 80. The myocardial test above described caused both his systolic and diastolic pressures to rise five millimeters, and his pulse rate to increase eight beats in the minute. Smoking a single cigar caused a rise of fifteen millimeters in both his systolic and diastolic pressures, but did not increase his pulse rate.

Also interesting in this connection are the following observations on a man thirty-seven years old, a physician, who, although fond of tobacco, used it very little because of an unusual susceptibility to its poisonous effects; even very moderate indulgence produces in him anginoid symptoms. This man's blood pressure, after he had taken a few whiffs of a cigar, was 100 systolic and 55 diastolic. After he had smoked one-half of the cigar, his systolic pressure was the same, but his diastolic pressure had gone up ten millimeters. The myocardial test previously described, caused his systolic pressure to rise to 115 while his diastolic pressure remained at 65; and increased his pulse rate to 100, which was considerably above his usual rate of 72.

The last three subjects mentioned, viz.: the excessive smoker who had anginoid symptoms, the excessive smoker who did not have anginoid symptoms, and the very moderate smoker with the unusual susceptibility to the poisonous effects of tobacco who had anginoid symptoms, all agreed in showing low blood pressure. In both the cases showing anginoid symptoms, the pulse pressure was made smaller by a single smoke, but this did not happen in the case without anginoid symptoms. In the case of the patient with anginoid symptoms who was an excessive smoker, the exercise test lowered both his systolic and diastolic pressures. In the other two it raised the systolic pressure and either did not affect at all, or slightly raised the diastolic pressure.

The few observations here given on the effects of chronic tobacco poisoning signify little by themselves, but they contain the suggestion that chronic tobacco poisoning has a disturbing effect on the vasomotor mechanism, and also that it has a disturbing effect on the myocardium, which manifests itself by signs and symptoms resembling those of myocardial degeneration. Extended observations conducted along these lines, especially with carefully guarded functional tests of the myocardium in relation to the different phases of tobacco poisoning, would seem to promise help in cleaning up the subject, at present obscure, of the effects of tobacco on the circulatory apparatus.

#### A NEW SIGN OF GALL-STONES.

BY

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Binet has pointed out (*Archives des Mal. de l'Apparatus Digestif*, March V, No. 33) that a tender point in the 9th to the 11th right interspaces signifies gall-stones in 63

per cent. of all cases, but, he adds, "the most striking sign is a sharp pain felt on pressure at the anterior end of the eleventh rib. This pain and tenderness seem to be characteristic only of cholelithiasis; they are frequently the first signs of a tendency to gall-stones and may prove the forerunners of an acute attack." In this connection I wish to call attention to the fact that when applying vibratory massage over a gall-bladder containing gall-stones this subcostal tenderness and stiffness is especially marked.

It is well known that gall-stones produce marked tenderness, stiffness, etc., in the region of the gall-bladder. The gall-stones irritate the gall-bladder and give rise to more or less congestion which is contributed to the adjacent parts. The natural result is stiffness and soreness, although these may be very slight. When a vibratory machine is put in action over the gall-bladder region at about the eighth to eleventh ribs it is easy to elicit these symptoms when present, even though ordinary palpation may not detect them. The tenderness developed by vibration may be so slight that only a comparison with the corresponding region on the left side will reveal it. But if there is any congestion or spasticity of the tissues present, vibration, with the resulting muscular contractions, will rarely fail to bring out the comparative increase of tenderness.

I use an olive-shaped and olive-large vibratory point. For several years I have been studying this symptom and have had an opportunity of observing it in many cases each year. I have yet to find a case where vibration has failed to indicate the presence of gall-stones by demonstrating an increase of tenderness and stiffness in the region of the gall-bladder.

## THE THERAPEUTIC USES OF WATER:

BY

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Water, pure and simple, as a therapeutic agent plays but a very minor part. That "cleanliness is next to Godliness" is as true as ever. This refers especially to external cleanliness. When for any reason the internal parts require water for cleanliness, then we are dealing with a toxemia. Water is the great natural solvent agent, consequently indicated under such conditions. The water used for this purpose must not, however, enter by the usual route, the gastro-intestinal tract, for from this point the toxic elements were swept into the circulation in the first place. If then we were to allow the water to enter the system by the usual route there would be great danger of dissolving still more of the same toxic material and the patient would be made worse instead of better and the system of hydrotherapy condemned. While we are striving to reduce the toxemia our first duty should be to prevent any more from entering an already overloaded system. This may be accomplished in several ways.

If it has been decided upon that water must enter by the usual route per orem, then the entire gastro-intestinal tract must be emptied. A day or two preceding the administration of the water for therapeutic purposes a brisk saline cathartic is administered. The diet is reduced to the lowest possible amount and should consist chiefly of coarse vegetables and

fruits, such as potatoes, turnips, carrots, string beans, celery, lettuce, apples, pears, etc. The coarsest kind of bread is the best. After two days of a diet of this kind and the use of cathartic salts, the patient is then instructed to drink at least four quarts of water per day. While the water drinking is going on all the avenues for elimination must be called upon to perform their function. The patient should at least once, but better twice each day undergo some sweating process. All the extra water drunk must not be passed out of the system by the way of the kidneys; the skin is able to remove all the extra water without any harm to itself in so doing. This water will be found loaded with toxins and the skin is better able to bear this than the delicate structures of the kidney. In fact as a usual thing the system is overloaded with toxins because the kidneys have either failed or else are unable from pathological reasons to perform their normal function, hence the toxic condition of the system. A treatment of this kind may last for a week or ten days, then three or four days of rest should be allowed, to again be followed by the same kind of treatment. It is no excuse to say that this is a treatment for sanatoria; I have had very little trouble in employing it in private practice, providing the patient is sick enough to follow directions implicitly.

Another method is the hypodermic method of introducing large quantities of water in the shortest possible time. A good sized hypodermic needle is attached to a fountain syringe and passed into the tissues. The abdominal wall is a favorite place. The container is filled with ordinary tap-water, boiled and filtered at about the body temperature and suspended about three feet above the level of the patient's body and allowed

to flow by its own gravity into the tissues. The small calibre of the needle and the patient's body offer sufficient resistance to the flow of water. In this way several quarts of water may be introduced into the system during twenty-four hours. The amount so introduced depends entirely upon the amount eliminated. Here, as before, the elimination by the skin must be made as active as the circumstances of the case will permit. The judicious use of such drugs as nitroglycerine and pilocarpine may be borne in mind. Frequently it happens that under circumstances where the use of water is indicated as here described there will be found a spasm of the capillaries and no matter what course the physician pursues no perspiration will take place. In such cases the vasomotor dilators are clearly indicated; and while either one of these measures alone may be futile, yet with both acting in harmony splendid results are possible.

The two methods mentioned are for the purpose of introducing large quantities of water into the system to dilute and remove toxic material from the body. They are indicated in all diseases arising from faulty metabolism, insufficient oxydation, loss of renal function or absorption due to chronic constipation or uterine infection.

There are certain other conditions which may require the introduction of water for other purposes than the dilution of toxins or their elimination. When a patient has suffered loss of large quantities of blood either from a surgical operation or through hemorrhage of any kind, the normal amount of blood as well as its normal specific gravity must be maintained. For this purpose a normal saline solution is prepared, showing by the hydrometer about 1055 sp. gr.; this is then introduced

in the same manner as the preceding only the quantity should be limited to approximately the amount actually lost if that is known; if not then one quart of such a solution may be introduced. After thirty minutes to one hour—the pulse being watched closely all the time—it may be repeated if deemed advantageous. The pulse is the best guide under such circumstances.

Under similar circumstances when after severe operations the stomach will not tolerate fluids, as for instance in cases of gastric carcinoma or ulcer, operations upon the stomach itself, where the patient is unconscious, or for any other reason can not or should not take water by mouth, then the introduction of water by the rectum becomes a necessity. The rectum and bowel are washed out until the water returns clear, then a rectal catheter is inserted as far as possible. Obviously considerable care must be given to the introduction. It has been shown time and again that the catheter on being introduced often has the bad habit of doubling upon itself, and instead of finding the distal end at the upper end of the rectum it will be coiled up low down. The catheter is best introduced by a gentle rotatory and pushing motion; after placing it properly it is attached to an ordinary fountain syringe. Somewhere in the line of flow a piece of glass tubing is inserted and above this a small stopcock. When all is ready and the patient comfortable, then turn on the water so that the water flows about sixty drops per minute. Two or three quarts may in this manner be given to the patient without disturbing him. The catheter should be fastened in position with some adhesive tape. Whether the method per oreum, subcutaneously or by the rectum has been selected, the principal thing to be borne in mind is to obtain proper elimina-

tion, and the skin must be made to perform the bulk of this work. If the kidneys alone are depended upon they may suffer from overwork and so themselves feel the effect of the systemic toxemia, thus laying a foundation for a future nephritis which would be worse than the original toxemia.

#### THE EXTERNAL APPLICATION OF WATER.

In the external application of water, excepting when used as moist dressings, the temperature employed plays the most important part. Here as in the use of any other therapeutic agent we must bear in mind the value of the reaction to this agent on the part of the system. The successful results of hydrotherapeutic measures depend upon the ability of the uninjured cells to react for the benefit of the patient.

We must bear in mind the exact reaction desired by the tissues; the reaction obtained is usually opposite to the condition produced by the agent at the time of its employment.

#### SHORT, COLD PROCEDURES.

##### *Primary reaction.*

1. Contraction of external—dilatation of internal—bloodvessels.
2. Pallor of skin.
3. Goose-flesh appearance.
4. Sensation of chilliness.
5. Trembling, chattering, shivering.
6. First quickening and then slowing of pulse.
7. Cooling of the skin.
8. Internal temp. at first raised, then lowered.
9. Perspiration checked.

##### *Secondary reaction.*

1. Dilatation of external—contraction of internal—vessels.
2. Redness of skin.
3. Skin soft, supple, smooth.

4. Sensation of warmth.
5. Sensation of comfort and well-being.
6. Slowing of pulse.
7. Heating of the skin.
8. Fall of internal temp.
9. Increase of perspiration.

#### **SHORT, HOT PROCEDURES.**

##### *Primary reaction.*

1. Dilatation of blood vessels.
2. Dusky redness.
3. Perspiration increased.
4. Heating of the skin.
5. Rise of internal temp. from diminished heat elimination.
6. Increased muscular irritability.

##### *Secondary reaction.*

1. Vasomotor constriction.
2. Pallor.
3. Perspiration lessened.
4. Gradual cooling of the skin.
5. Fall of internal temp. from increased heat elimination.
6. Muscular weakness.

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### **EFFECT OF ALCOHOL ON LONGEVITY.<sup>1</sup>**

BY

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The experiments of physiologists indicate that alcohol in moderate quantities may be of value as a food, and that it is analogous to sugar and fats, but, in the judgment of the author, it is a very dangerous one, because the laboratory experiments do not represent the conditions as they exist in every-day life. They do not properly allow

for the increasing need and desire for alcohol, and for its taking the place largely of solid food among excessive users.

The results of various tests made by Kraepelin, Rivers and others, into the effect of small doses of alcohol on muscular power, indicate that it has a detrimental effect. Opinions from famous soldiers like Kitchener and Roberts, show that in warfare abstainers stand more hard work than those who drink in moderation. The popular opinion that more work can be done with alcohol than without it is not supported by the facts, and is doubtless due to the pleasant buoyancy feeling which alcohol produces.

With regard to mental efficiency, tests of translating from one language to another, of adding, of writing, of memory, etc., show a marked loss of efficiency through small doses of alcohol. The Rosanoffs concluded that "Alcohol impairs every human faculty that has been tested, the higher and more complex the faculty, the more pronounced is the effect."

The opinions and experiences of the medical profession are then considered. There seems to be a general consensus of opinion that operations are not likely to be so successful on alcoholic patients as on abstainers, that alcohol plays an important part in bringing about degeneration of nerves, muscles and epithelial cells. "The role of alcohol," says a prominent physician, "in the nervous and mental economy is in the healthy individual an evil one." Attention is drawn to Dr. C. E. Woodruff's paper on the beneficial effect of alcohol in the Tropics, but the author does not find a similar effect in the United States.

In order to show the effect of alcohol on mankind, statistics are given of the mortality of men engaged in the manufacture

<sup>1</sup> Author's Synopsis of Address at the Conference on Race Betterment, 1914. Specially prepared for AMERICAN MEDICINE.

and sale of alcohol. These men were insured by forty-three of the leading life insurance companies, and their habits at the time of application were considered satisfactory. The mortality shown in the following tables represents the *extra* mortality over the normal experience of these companies:

*Saloons*:—Proprietors and managers not attending bar—extra mortality, 82%.

Proprietors and managers attending bar—extra mortality, 73%.

*Hotels With Bar*:—Proprietors, superintendents and managers attending bar—extra mortality, 78%.

The following deals with men who do *not* attend bar, although liquor is served on the premises:

*Hotels With Bar*:—Proprietors, superintendents and managers *not* attending bar—extra mortality, 35%.

*Restaurant With Bar*:—Proprietors, superintendents and managers *not* attending bar—extra mortality, 52%.

Statistics were also supplied of persons in two other branches of the liquor business, as follows:

*Breweries*:—Proprietors, managers and superintendents—extra mortality, 35%.

*Wholesale Liquor Houses*:—Proprietors and managers—extra mortality, 22%.

In the class composing the wholesale liquor dealers there were 992 deaths, and if these men had been in non-hazardous occupations there would have been about 180 less deaths.

A study of the causes of death shows the effect of alcohol; for example, among the hotel proprietors, superintendents and managers who attended bar, the death rate from cirrhosis of the liver was six times the normal; from diabetes and Bright's

disease, three times the normal; and from apoplexy, twice the normal.

*Formerly Intemperate*. The experience of the life insurance companies was also given among men who had used alcohol immoderately in the past, but had reformed at date of application for insurance. They were *not* connected with the manufacture or sale of alcohol. It was shown that the life insurance companies had experienced about 50% extra mortality among men who occasionally drank to excess more than five years prior to date of application and had been temperate since that time. Even among those who had taken a cure for alcoholic habits, and had been total abstainers from that time to the date of application for insurance, the mortality was about one-third higher than the normal. Those were the best cases of the type and were selected with particular care by the companies.

*Steady Drinkers*. One of the most interesting exhibits was that of two large classes,—the men in one class drinking two ounces of alcohol or more daily, but not immoderate or excessive users; and the other using less than two ounces daily. In the latter group a large proportion consisted of persons who stated that they drank two glasses of beer or one glass of whiskey daily, and were therefore considered as steady drinkers. Both of the classes were composed of men who were considered average lives by the insurance companies, the habits not being considered of serious moment. The mortality, however, of the men who took two ounces or more of alcohol daily was found to be fully 50% higher than among the more abstemious class. None of the men in these two classes were connected with the production or sale of alcohol when they applied for insurance.

*Abstainers v. Non-Abstainers.* A prominent insurance company divided its policy-holders into four classes, depending on the extent to which they used alcohol. The following table gives the percentage of the mortality on the basis of the American table:

*Total abstainer*—relative mortality, 59%.

*Rarely use*—relative mortality, 71%.

*Temperate*—relative mortality, 84%.

*Moderate*—relative mortality, 125%.

According to the foregoing table, the mortality among the moderate drinkers was fully twice as high as among the total abstainers. There are no other modern statistics of American companies comparing abstainers and non-abstainers, and the author accordingly turns to the experience of companies in other English-speaking lands. In these companies the insured are divided into two sections,—abstainers, and non-abstainers. In the former class were placed those who were abstainers at the date of application, and who continued to be abstainers thereafter; if they ceased to be total abstainers they were transferred to the non-abstainer section. The companies endeavored to exclude from the non-abstainers' class those who used alcohol immoderately. In the following table is given the extra mortality in the non-abstainers' over the abstainers' section:

United Kingdom Temperance and General Provident Institution (England)—extra mortality of non-abstainers over abstainers, 35%.

Scottish Temperance Life Assurance Company (Scotland)—extra mortality of non-abstainers over abstainers, 40%.

Sceptre Life Assurance Company (England)—extra mortality of non-abstainers over abstainers, 50%.

Australian Temperance and General Life Assurance Society (Australia)—extra mortality of non-abstainers over abstainers, 60%.

Manufacturers Life Insurance Company (Canada)—extra mortality of non-abstainers over abstainers, 75%.

The author is satisfied from the foregoing statistics that abstainers live much longer than non-abstainers.

There is no consensus of opinion regarding the cause for the very low mortality among abstainers. Some actuaries believe that it is due to abstainers being generally non-users of tobacco, and careful with their diet. Others think that abstinence from the use of alcoholic liquors as beverages is conducive to health, and promotes longevity. Whatever may be the cause for this great difference in mortality between abstainers and non-abstainers, the author believes that the advantages claimed for alcohol are a small offset to the evils which proceed from its use and its abuse.

## THE PROBLEM OF SEWAGE DISPOSAL.

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The problem of efficient sewage disposal is one which confronts everyone, individually and collectively.

In a newly settled and sparsely populated country, primitive methods are usually in vogue and generally serve the purpose without damage to anyone. Huge tracts of land, or large bodies of water, apparently show no evidence of these trivial pollutions, as we may term them. But as population increases such primitive methods are no

longer safe, and other individuals than the transgressor are endangered as regards their health. Hence arises the necessity of adequate modes of sewage disposal, which shall minimize, to the lowest possible extent, all danger to the health of others: common justice, or equity, demands that neither land, nor bodies of water can be polluted to the detriment of others.

Faulty sewage disposal usually ends in water pollution, and since it is the bodies of fresh water in a country which supply that required for drinking purposes, it becomes obvious at once that these sources of drinking supplies must be protected from sewage contamination, as far as is humanly possible. I think it will be wise, however, for us to try to appreciate the difficulty surrounding such a proposition,—it must be recognized that from individual establishments, as well as communities of all sizes, a certain amount of sewage is bound to accrue, and that such sewage must of necessity follow the lines of the natural drainage of the country side,—that is, the streams, rivers, and lakes, etc. No matter what we may do to the polluting material, the resultant liquid still finds its way to the natural drains of the country side. If the sewage be allowed to go on in its crude state to join the natural surface drainage of the country, then certain rivers, etc., will undoubtedly suffer to a degree commensurate with the volume of contaminating material, or sewage: primarily proving a nuisance, and secondly a menace to health. All acknowledge the vast potentialities of sewage as a carrier of disease. The problem therefore is how to handle or treat sewage so that it shall be rendered as harmless as possible. This introduces the question of sewage treatment.

First let me direct attention to the constituents of sewage, arranged in a manner to indicate what we have to deal with, especially from the point of view of sewage treatment, as we are acquainted with it ordinarily.

#### *Germs.*

#### *Living organisms.*

#### *Food for germs.*

Soluble organ. matter (N & non N)

Insol. organ. matter (N & non N)

Mineral matter

Water

In such an arrangement lies the keynote or clue to the results we can accomplish by known methods of sewage treatment.

(1) *Purification of Chemical Constituents*,—a process which accomplishes the removal of the nuisance, and at the same time a loss of food for bacteria, pathogenic and putrefactive.

(2) *The Destruction of Germ Life*.—To be brief, nearly all known methods in favor at the present day, aim at No. 1,—the purification of chemical constituents,—and it is only a few recent schemes which attempt No. 2,—the total destruction of germ life. Even in these latter, a preliminary stage of purification or removal of the organic chemical constituents is essential, for the reason that no disinfection (i. e., destruction of germs) is satisfactory until or unless the organic matter is removed. Its presence interferes with disinfection because it is impossible to make the disinfectant penetrate pieces of solid matter, a form or state in which the suspended solids exist in sewage. So that, so far as our present knowledge takes us, No. 1 is requisite whether we go in for No. 2, or not. In this respect I may point out that the abstraction of food supplies for bacteria,

which is accomplished by No. 1 of necessity embraces to a certain extent, the aims and objects of No. 2, for if we remove the means of support to germs, we necessarily effect a certain amount of destruction.

With such knowledge, we are in a position to review rapidly all the known schemes of sewage purification.

Without exception the central feature of all these schemes is the oxidation of the organic matter, and this oxidation is brought about by the agency of aerobic germs,—i. e., germs requiring oxygen for the continuance of their proper vital functions. There are many different kinds of bacteria comprised within this class, but they all have the common characteristic feature of requiring oxygen in order to live and functionate. By means of these vital functions they are able to convert organic matter into  $\text{CO}_2$ ,  $\text{H}_2\text{O}$ , etc., and any nitrogenous moiety into  $\text{NH}_3$ —passing into  $\text{NO}_3$ . The whole process is considered to be one of oxidation, but differing from ordinary chemical oxidation in the fact that it requires living germs to bring it about. With this understood, it can always be referred to as "oxidation" simply.

In order to obtain a good final effluent, no matter to what preliminary treatment we may subject the raw sewage, we have to call into requisition one of the following processes:

(1) Land treatment, (2) contact beds, (3) percolating beds. These three methods depend for their proper working upon the aerobic bacteria which live and thrive therein. The upper layers of the soil form the chief home for aerobic germs,—the home allotted to them by nature. Contact beds and percolating filters are merely artificial arrangements devised by man to house the maximum number of aerobic germs in the

minimum of space,—thus imitating, and, to a certain extent, improving upon, nature.

Though I have emphasized the existence and importance of the great class aerobic bacteria, I must also state that there are other groups of germs possessing a measure of importance, to which I shall have occasion to refer later,—chief of which is the group anaerobic germs. These organisms thrive and functionate best in the absence of oxygen,—just the converse of the aerobes,—and their chief function in life seems to be conversion of solid organic matter into a soluble form, somewhat less complex in chemical composition.

Amongst the various well known schemes of sewage purification, are certain preliminary treatments of the raw or crude sewage, with a view to rendering it easier to handle by the aerobes, which in all schemes produce the final purified effluent. For instance we have sedimentation tanks, septic tanks, and chemical precipitation tanks. Sedimentation tanks are simple reservoirs into which the raw sewage is conducted, and there allowed to remain for a longer or shorter time, in order to permit the suspended solids in the sewage to settle to the bottom of the tank, where they collect, and form sludge. The essential feature about these sedimentation tanks is that they only retain the sewage for the shortest possible time commensurate with the settling of the suspended solids,—the idea being to avoid a long stay for the sewage, because decomposition soon sets in, and the sewage becomes altered. Usually this scheme resolves itself into the passage of sewage into one end of a tank and out at the other; the liquid having its velocity reduced just enough to enable the solid particles to settle down.

Chemical precipitation is to be looked upon as a more perfect form of sedimentation of suspended solids as carried out in sedimentation tanks. To accomplish this end a certain amount of some chemical precipitant is used, usually lime or some salt of iron, and this substance when added to the raw sewage causes a very complete deposition of the suspended solids by virtue of the production of flocculent masses, which in their formation enmesh and carry down the solid particles. A vast quantity of sludge is thus produced, consisting of all the suspended solids, plus the precipitant. Septic tanks although in appearance like sedimentation tanks, retain the sewage for about 24 hours,—thus not only do the solids settle to the bottom, but sufficient time elapses for the germs to get in a good deal of work, and profoundly change the original character of the raw sewage. These septic tanks are constructed with a view to encouraging the growth and activities of the anaerobic group of organisms,—whose function, as I have before remarked, is to convert solid organic matter into a liquid form, of a less stable nature, chemically speaking. We thus get a contrast between the products of sedimentation and septic tanks. In the former the solids are simply deposited upon the bottom of the tank, practically unchanged, whereas in the septic tank not only are these solids deposited, but part of them are actually eaten up or digested by the anaerobic bacteria,—the liquid products being added to the liquid flowing out of these tanks.

This is shown in the following table, which gives the results of observation of a tank extending over a long period:

Total suspended matter in raw sewage .....	996 tons
Undigested sludge remaining in tank .....	286 " =29%
Carried away in effluent from tank .....	381 " =38%
Sludge digested in tank.....	329 " =33%

Thus all these preliminary forms of sewage treatment aim at the separation of the suspended solids from the liquid portion of the original raw sewage,—this separation being very complete in the case of chemical precipitation, and less so in sedimentation. There is a difference in the case of the septic tank however, for here we have a certain amount of liquefaction of the suspended solids, which product is added to the liquid portion of the original raw sewage; and also during this process the suspended solids which are not liquified are changed, as shown by the character of the resultant sludge. This sludge from a septic tank is not really very putrescible, whereas that from a sedimentation tank is highly so.

Table showing results of preliminary treatment.

	Efflu-	Sludge	ent	Parts per 100,000
Chemical precipitation,	70	4.3	14.3 parts lime added	
Stagnant settlement,	51.5	8.6	none digested	
Flowing,	45.7	14.3	none digested	
Septic tank,	22.8	18.6	18.6 parts digested	

Sewage on which above experiments were made contained 60 parts suspended solids. The reason why these preliminary treatments are adopted is that all soluble organic matter, contained in the liquid portion of the original raw sewage, is easily disposed of by the aerobic germs, which are always the final workmen to finish off and purify the sewage. As we shall see, these aerobes can dispose of the soluble organic matter very rapidly, while they are only

able to dispose of solid organic matter very slowly indeed. This brings us to the digestion of organic matter by bacteria. For our purpose we may represent organic matter, as occurring in sewage, by the following grouping of elements, which go to form a complex molecule. What their exact proportions are in the molecule does not matter.

C, O, H, N, P, S, Cl.

This arrangement is sufficient to express either soluble or insoluble organic material.

The functions of anaerobic bacteria relate chiefly to insoluble organic bodies. Doubtless they act upon soluble material equally well, but as we shall see later, this need not occupy our attention at present. These organisms are noted for their powers of converting solid into liquid organic matter, accompanied by the disengagement of foul smelling gases. During this process a simplification of the complex organic molecule takes place. The soluble bodies produced are less stable, and more easily affected than the original substance from which they were derived; but these liquid bodies, although less complex contain the same elements as the very complex original molecule,—C. O. H. N. P. S. Cl.—apparently a rearrangement has taken place, with a decrease of the atoms in the molecule. These soluble products are of the nature of peptones, albumoses, etc. In this process of rearrangement or shuffling of the elements, some of them break off, going to form such things as gases, which we know are given off during the time the anaerobes are acting upon the organic matter. I have chosen nitrogenous organic matter in sewage as my example for showing the changes wrought by the anaerobes,—there are other organic bodies belonging to the hydrocarbons and carbohydrates, like fat and cellulose, occurring in sewage, but the liquefaction of these

by the bacteria is a much slower process, in fact in actual practice only a small part of them is broken down, the remainder going to form sludge. Of course these substances being non-nitrogenous, cannot give rise to those nitrogenous bodies allied to peptones, albumoses, etc. The products are most probably CO<sub>2</sub> and H<sub>2</sub>O. Turning now to the action of aerobes on organic matter, we find a marked contrast between their work and that of the anaerobes. They also produce different results after exerting their powers for 2 or 3 hours, according to whether the organic matter be soluble or not. In the case of soluble material they bring about a profound reduction of the complex molecule very rapidly, breaking it up into simple stable end products shown sufficiently well in the following scheme:

C	H	O	N	P	S	Cl
CO <sub>2</sub>	H <sub>2</sub> O		NH <sub>3</sub>	PO <sub>4</sub>	SO <sub>4</sub>	Cl
			NO <sub>2</sub>			
			NO <sub>3</sub>			

I have indicated the acid radicles only, it being understood that they exist in the form of salts of the natural bases present. The oxygen in the molecule is taken up to form part of the oxygen-containing products,—it is never sufficient to supply all the oxygen required for these end products, hence the absorption of a large amount of atmospheric oxygen. Some suppose all the nitrogen is primarily converted into ammonia, and this in turn into nitrites, passing into nitrates. Personally I doubt this very much; I am more inclined to think that along with the first formation of ammonia we get nitrites at the same time. I do not deny that some of the ammonia passes into nitrites, but I do deny that all nitrites are derived from ammonia. However this point

is of academic interest only. The above scheme is not a complete or perfect representation of all of the chemical processes taking place in the breaking down of the complex organic molecule, but it is sufficiently accurate for our purposes, and brings out the general results in a clear fashion. The changes brought about in soluble organic matter by aerobic bacteria, above described, take place with great rapidity,—under certain conditions, within the space of a few minutes.

When we consider their behavior with reference to solid organic matter, we find that they act in the same way, but very much more slowly. That is, they produce the same end products, but the time taken is many days, compared with a few minutes as in the case of soluble organic material. In practice therefore, when time is very limited, these bacteria acting upon a mixture of soluble and solid organic matter, rapidly break down the soluble portion into end products, but not having the chance (by reason of not having the time) to affect the solids very largely—they effect an incomplete reduction, the nature of which it is important for us to note. Any part of the solids they may have digested are converted into the typical end products, as we have seen, but the remaining portion is no longer the same as the original stuff,—for although still solid material, it is changed, both in color and composition,—it is "sludge." We may express the results produced by the action of these two groups of bacteria upon organic matters contained in sewage, as follows:

Aerobes = stable end products + sludge.

Anaerobes = soluble organic matter + sludge.

Dividing raw sewage into two parts, (1) a liquid portion, containing soluble organic

matter, and (2) solid organic matter, in suspension (ignoring the mineral substances like sand and iron oxide), we find that practically all the soluble material is digested, whereas only a part of the solids are so disposed of. A sludge is produced which although of an organic nature, differs widely from the original solid suspended organic matter in raw sewage, in the fact that it is only capable of further reduction with difficulty, and therefore very slightly putrescible; it has rather a carbonaceous appearance.

It is impossible to do more than give a rough idea of the actual nature of this sludge, that is to say, the actual chemical composition is difficult to attempt, for the simple reason that it is rather an uncertain quantity.

	Perco-	Double	
	Septic	lating	contact
	tank.	filter.	beds.
Loss of ignition.....	62.0	44.7	52.14
Ferric oxide.....	16.14	44.7	43.6
Sand .....	56.5	27.0	22.2
Other mineral matters	34.3	26.4	25.0

(Figures indicate parts per 100,000.)

We can state definitely that it is not one single chemical body, but a mixture of many, and what is more, the mixture varies under different conditions. For instance, some sludges are rich in cellulose; others contain a preponderance of fatty substances; in fact the character of the raw sewage governs to a large extent the nature of the sludge produced from it, after it has undergone treatment.

In towns where cotton or woolen industries are carried on, large quantities of these substances find their way into the sewage of the town, and appear at the sewage works, imparting to their respective sludges quite peculiar characteristics. Again iron

salts are present in every sewage, but in some they bulk large, and we always find them in the sludge at the sewage disposal plants.

There is always in these sludges a small proportion of nitrogenous organic matter. (See analytical tables, septic tank, also percolating beds.) It is really not of great vital importance, however, (and this is fortunate) to know the exact chemical composition,—what is of importance is to know that the organic part of sludge is very slowly acted upon by bacteria, and that it takes a very long time to actually break it up; what is more, in this process of reduction no nuisance is caused and no noxious products are given off, at least to a noticeable extent. It may be that such bodies are actually produced, but in any case they are formed so slowly and in such small quantities as to be easily carried off, and, mixing with the general atmosphere, are not detectable. Many people regard such sludge as a kind of earth, and have given to it the name of "humus,"—not a bad name either, because it behaves precisely as if it were mould or earth. When dried it is blackish or brownish in color, and crumbles readily to powder. It possesses only slight manurial value. I should like to bring forward a little evidence, however, to prove that the organic portion of sludge can be broken down to simple end products, e. g.  $\text{CO}_2$ ,  $\text{H}_2\text{O}$ ,  $\text{CH}_4$ , etc., under the influence of bacteria and animalculæ,—but this breaking down process takes a long time.

For instance take application of sewage to land,—bacterial action purely aerobic. It is well known that the soluble organic matter is very rapidly disposed of, but the solids remain on the surface, there to undergo slow disintegration. If sewage is applied too often, these solids naturally accumu-

late, and eventually block up the interstices of the soil,—the land becomes "sewage sick." At this point let the applications cease, and allow the land a good long rest,—it will recover itself, and all the organic matter will finally disappear, the insoluble mineral constituents only being left behind. During this process the sludge has actually been produced, but eventually it too disappears, showing that the organic portion can be disposed of in course of time. Even such substances as cotton fibre, wood, hair, and horny material, all eventually disappear absolutely.

In the case of contact beds and percolating filters (both artificial homes for aerobes),—a precisely similar train of events takes place as in land treatment. Here we get the soluble organic matter disposed of at once, and the solids so acted upon as to produce a sludge,—this collects in the interstices of the bed, and if it is not washed out, will finally choke it. Now if the bed be rested for a good long time, it will recover, and we shall find it is no longer choked,—only the insoluble mineral matter remaining; all the organic material having completely disappeared under the influence of bacteria, etc.

Some slight idea of the nature of sludge produced by aerobes may be gathered from the analytical tables relating to percolating filters.

I have thus incidentally contrasted the actual practical working of land and aerobic beds. In the case of artificial beds the sludge deposit has to be washed out occasionally, and this is accomplished by means of a hose pipe. In the case of land such a washing process is impracticable.

As I have shown already how this sludge is produced largely if not entirely, from the solids in suspension in raw sewage, it fol-

lows in the case of land treatment that we must either give the germs in the soil a long time to dispose of the solids (which means only very occasional applications), or we must eliminate them from the sewage sent on to the land.

We have in this an explanation why land treatment is not economical where large quantities of raw sewage have to be dealt with,—the area of land required becomes prohibitive. It also explains why the coarsely constructed percolating filters have come into such favor; they free themselves of the sludge to a very great extent. In both contact beds and percolating filters, the finer the material composing the bed, the more rapidly will the bed become choked.

We must now concern ourselves with a fuller consideration of percolating filters and contact beds,—more especially with a view to bringing out the changes wrought by the aerobes upon the soluble organic matter.

Up to this point I have dwelt principally upon the facts relating to sludges, and to this extent I have anticipated the working results of these two classes of beds: however, as the formation of sludge is an important function of these beds, the anticipation is not out of place, and we may therefore proceed to study in addition, the more characteristic reduction of soluble organic matter, which is such a marvellous feature of these beds.

Take the percolating beds first,—as I have already mentioned, these beds may be constructed of fine or coarse material, but experience has taught the superiority of the coarse, because the interstices being so large, the bed is not so liable to choking. The "Leeds Bed" is a good example. It is composed of pieces of clinker, each piece not

less than 12 inches across,—the depth of the bed being 10 feet, and the diameter 45 feet. A revolving sprinkler distributes the liquid on to the bed.

When fully matured (i. e. the clinker well coated with masses of aerobic germs), the results obtained are very striking, and especially so when we bear in mind the time taken for the liquid to pass through the bed as being, on the average, not more than 3 or 4 minutes. Please note that this statement refers to liquids only, and not to suspended solids. Numerous observations show that it takes on the average, 10 to 14 days for the solids to work their way through,—a sludge question again.

From my preceding remarks it is obvious that two kinds of liquid may be fed to the bed, (1) those containing large quantities of suspended solids, e. g. raw sewage, and (2) those practically free from them, e. g. the effluent from a chemical precipitation tank. To put the matter briefly, the question resolves itself into this,—if we feed the suspended solids we get sludge formed in the bed,—while if we take them out as a preliminary treatment, we have them in the preliminary tank; we are bound to get the solids, in the form of sludge, either at the beginning of the process, or at the end. But, as a matter of economic working, we do not want them at both ends. The choice is largely influenced by local conditions. If sludge can be easily disposed of,—carted away, sold, etc., then the chemical precipitation, or sedimentation systems give good results: for it will be remembered that the sludge produced from these tanks is highly putrescible and therefore acts as a powerful fertilizer.

The resulting sludge in all cases is, however, very large in bulk, and in actual prac-

tice great difficulty is experienced in getting rid of it, for as a fertilizer, it does not seem to be popular.

The effluent from these tanks contains very little suspended solids, but plenty of soluble organic matter. If such a liquid be fed to percolating beds we get marked purification, with formation of very little sludge. (See tables.)

The accumulation of solids in the bed being so very small, they are able to run on in continuous operation for a long time,—an extremely satisfactory result.

If, however, it becomes a question of feeding solids to the bed, great difficulty arises in making a choice. The more solids we feed to the bed, the greater the amount of sludge produced in the bed.

We can send either the whole, or a part, of the suspended matter contained in the original sewage, on to the bed,—if a part, then the remainder will be caught up in some preliminary tank treatment. (See table of suspended matter in tank effluents.)

If sludge appears in any great quantity in the effluent from the bed, then it has to be removed, and on the principle that we do not want sludge removal at both ends of the sewage purification process, many people lean towards the view that it is really better to send all the solids along to the bed straight away, and remove the resultant sludge once for all from the bed effluent. (See tables of percolation beds followed by settling or filtration). By this process we do not get anything like the bulk of sludge to dispose of as we do in chemical precipitation schemes, a point in its favor. But it must not be forgotten that by feeding the whole of the solids, we are open to the maximum risk of choking the bed. By using very coarse material in the construction of the filter, we minimize this risk as far as

possible,—in practice, it is found that the flow of liquid through the large interstices is sufficient to carry with it most of the sludge,—it comes away in gushes, not evenly,—hence the necessity of washing with a hose pipe does not arise as frequently as it does in those beds constructed of finer grade material.

In contact beds a similar aerobic action takes place, but there are one or two differences in the way of procuring results.

These beds consist of tanks filled with some material which serves as a lodgement for bacteria. The liquid to be treated is fed to them until the tank is full; it is then allowed to remain in contact with the germs for a period of about 2 hours, then it is drawn off.

It will be observed that in this process, the germs situated on the lower layers of the material are shut off from a free supply of oxygen from the air, and consequently behave in a different fashion to their brethren in the upper layers of the same bed, or on a percolating filter, where the supply of air is very free.

This fact causes them to produce a different effluent, as is shown by a perusal of tables of contact 1 and 2. Compare this with percolating filter. The lack of oxygen is characterized by the non-formation of nitrates,—but if we subject this fluid to a second treatment and so further oxidise it, we shall finally get a decent effluent, perfect in every way. (See tables of contact beds 1 and 2.)

From a study of the actual chemical changes which take place according to Adney, Letts, and McGowan, the breaking down of organic matter is supposed to be brought about in two stages. The first is an oxidation with production of carbon dioxide, water, etc.,—and this stage has

been referred to as one of carbon oxidation. The second stage has chiefly to do with the oxidation of ammonia into nitrites, passing into nitrates.

Of course these stages are not in reality quite separate and distinct, but it is convenient to adopt this hypothetical division.

There is no doubt about the carbon part of the organic matter being the first to be attacked, as evidenced by experiments,

ments wherein the breaking down process was extended over several days.

If the supply of oxygen be limited, the carbon oxidation stage is the only one to take place, no nitrates being formed.

Although these stages are distinct and probably take place one before the other, nevertheless it must be obvious that in any continuous process of sewage purification, they must at certain times be going on side

ANALYTICAL TABLES. Results in parts per 100,000.

	Free NH <sub>3</sub>	Alb. NH <sub>3</sub>	Oxygen absorb.	Nitric N.	Soluble solids	Solids in suspen.
<i>Septic Tank + Two Contact Beds. Three years' experiment.</i>						
Crude sewage .....	3.13	.87	11.24	....	106.7	62.86
Tank effluent .....	1.84	.606	7.8	....	91.3	25.7
No. 1 contact bed .....	1.14	.26	1.67	....	91.57	9.3
No. 2 contact bed .....	.34	.063	.48	1.76	99.3	.34
<i>Septic Tank + Percolating Filter. Four years' experiment.</i>						
Crude sewage .....	3.2	1.09	11.77	....	106.86	58.8
Tank effluent .....	2.37	.54	6.07	....	90.0	13.6
Filtrate, unsettled .....	.62	.18	1.6	1.08	9.03	10.4
Filtrate, settled .....	.62	.101	.7	1.06	84.3	3.0
<i>Settled Sewage + Percolating Filter. One year experiment.</i>						
Settled sewage .....	2.11	.48	5.6	....	98.14	12.1
Filtrate, unsettled .....	.36	.164	1.6	1.28	89.7	12.1
Filtrate, settled .....	.326	.086	.9	1.4	92.4	6.0
<i>Chemical Precipitation + Percolating Beds. Nine months' experiment.</i>						
Crude sewage .....	2.51	.927	12.1	....	108.4	62.4
Precip. tank effluent .....	2.43	.386	4.16	....	102.6	6.3
Filtrate .....	.41	.09	.67	1.63	101.6	2.0
<i>Crude Sewage + Percolating Bed—"Leeds Bed." Three years' experiment.</i>						
Screened sewage .....	2.8	.8	10.27	....	104.0	53.3
Filtrate, crude .....	.876	.34	3.09	.35	95.0	21.0
Filtrate, settled .....	.74	.194	1.47	.44	87.6	6.1
Filtrate, filtered .....	.63	.127	.93	.6	89.3	3.6
<i>Contact Beds (3 ft. deep) + Settled Sewage. Nineteen months' experiment.</i>						
Crude sewage .....	3.0	1.35	12.5	....	97.7	60.6
No. 1 contact bed (rough) .....	1.31	.413	2.96	....	99.6	16.6
No. 2 contact bed (fine) .....	.833	.154	.934	.373	99.46	4.83
<i>Contact Beds (6 ft. deep) + Settled Sewage. Nineteen months' experiment.</i>						
Crude sewage .....	3.1	1.44	13.5	....	117.3	66.3
No. 1 (rough) .....	1.71	.536	4.23	....	32.06	21.4
No. 2 (fine) .....	.521	.013	.8	.65	112.3	3.7

I am indebted to Mr. W. H. Harrison, M. Sc., for the above figures, contained in his Leeds Report.

simple carbon compounds, CO<sub>2</sub>, etc., being the first products to be detected, that is before any ammoniacal compounds. In the case of the very rapid changes brought about in a percolating filter, where the whole process occupies only about 3 minutes, it would be impossible to say that one set of compounds appeared before the other; but the theory is based upon experi-

by side. The consumption of oxygen from the air required in these two processes is quite considerable, and if the supply of air be limited the germs will endeavor to procure it elsewhere, from chemical substances containing available oxygen, e. g. nitrates. This can be proved by taking some effluent containing a small amount of oxidisable organic matter and some nitrate, bottling it up

so as to exclude air. If the supply of available oxygen in the nitrate has been just sufficient for the complete oxidation of the organic matter, no trace of nitrate will be left after a few days. This simple experiment is important, because it shows that we can have an effluent not completely freed of organic matter, but containing plenty of nitrates, and this effluent will possess per-

Following out this line of reasoning, and applying it to contact beds, where we have seen that during the process of filling, remaining full, and emptying, the supply of air to the lower layers must be very limited, we should expect to find nitrates either very small in amount, or absent altogether.

This is precisely what does take place, the first part of the effluent drawn off from



Fig. 1.. The Durand Twins—showing union.

fect keeping qualities. On the other hand, if nitrates are not present in sufficient quantities, then such an effluent will go bad, or in other words, will become subject to the action of undesirable putrefactive organisms. It is hardly necessary for me to point out that we can have an effluent devoid of nitrates, and still of good keeping quality but it must not possess any oxidisable organic matter.

the bed, that is the portion of liquid in contact with the lower layers, is usually devoid of nitrates; whereas the last portion which has been in contact with the upper layers, is particularly rich in that substance. All these chemical considerations are extremely important, and very necessary for a person to know, if that person is to take charge of a sewage disposal plant, and get the best possible results from it.

## THE DURAND TWINS.

(By our Special Correspondent.)

These twins are girls named Madeleine and Suzanne Durand. They were born on November 28, 1913 and have developed normally up to the present time. They are united by a piece of tough fibrous tissue about four inches thick and twelve inches in circumference. As can be seen in the illustration, this union is below the sternum

two-thirds of an inch. Suzanne seems to be the stronger, and the bones of her limbs are a little longer than Madeleine's. The hands and feet of Madeleine are smaller, her face is round, while her sister's is oval, and her heart pulsates 120 times to the minute, against 130 per minute for Suzanne. The body temperature of the twins differs little if at all; there is a marked difference in their cries, however.

Of striking interest is the difference in



Fig. 2. The Durand Twins nursing.

and not far from the umbilicus. An X-ray examination indicates that the lungs and the hearts of the twins are entirely independent of each other. There are two oesophagi, two stomachs and two intestines, but the two abdominal cavities are in communication. A curious phenomenon is that when one inhales the other exhales.

Madeleine's length is stated to be 16 inches while Suzanne's is 16½ inches, and the latter's chest measurement is greater by

the blood of the twins. By a microscopic examination of the blood there has been counted 6,280,000 red and 6,325 white globules per cubic millimeter in the case of Madeleine, and 6,960,000 red and 7,500 white globules in that of Suzanne.

The father of the twins is thirty-five years old and perfectly normal. The mother's age is forty-four. By her first marriage she had a son who is now twenty-three years old and normal in every way.

# THE ANNOTATOR

**The Food Faddists.**—Dietetic fads are coming in for a lot of deserved criticism. We have long pointed out the fact that nothing seems too absurd to be taken up seriously and exploited by fanatics. We are quite sure that considerable harm to health has resulted to many who took up this or that system on the plausible arguments of its advocates. We do not go so far as to tell people to eat what they want and when they want it, for that only creates another fad. There are mighty few foods which are harmful to a healthy stomach in a healthy man if he eats like a man and not like a hog, and extreme regularity of meals is not the necessity we once believed. Young people rarely overfeed, but the well-to-do middle aged man of sedentary employments generally does. When ill-health comes on, the situation is entirely changed for then dietetics assumes the importance of life and death. It is now a scientific matter requiring very great knowledge and skill and a very particular inquiry into the needs of each particular case. It is a matter no layman should attempt to decide for himself. Of course the science is still crude and we sometimes make errors, just as engineers do in bridge-building which is the most exact of all sciences and arts. But on the whole, dietetics might be said to have at last a solid foundation of scientific experiment, and when it has sloughed off its parasitic fads, it will be reliable. Our digestive organs have changed enormously since the time we lived on rough raw food, and it is absurd to return to a "natural" diet which only an animal's organs can digest. Nor should we run the risks of the food infections which wipe out primitive peoples. It may be natural for children to bolt their food, and though they must be taught to chew it, we need not



worry unduly if they learn very slowly. It may be more economical for an adult to chew each mouthful thirty-two times, but it will not kill us if we stop short should we think the job finished before the thirty-second crunch. Sweet reasonableness in all things, will not tolerate fads, therefore let us enjoy life reasonably while it lasts.

**Errors of Diagnosis and Vital Statistics.**—The inaccuracy of medical diagnosis is becoming almost a scandal. Of



course, no one can expect a physician to know the hidden, and many of the errors recorded at autopsies are of conditions which gave no signs or symptoms during life. To have known them would have required clairvoyance. Still it is rather disconcerting to learn from some statistics published by Dr. Horst Oertel, Scientific Director of the Russell Sage Institute of Pathology, New York, (*The American Underwriter*), that in one of the best known hospitals with every facility for diagnosis, in only 22.5 per cent of the autopsies was the diagnosis confirmed. In 14 per cent it was partly correct and in 34.1 per cent it was entirely wrong or not made at all! Death certificates can be of little value for statistical purposes when to these difficulties are added carelessness, haste and ignorance. In the study of the state of public health and its changes, we must then make great allowance for error. We cannot be sure of many of the alleged changes in frequency of any affection. Public safety really demands that there shall be an autopsy after every death, but there is no use discussing it because public opinion will not tolerate it. Nevertheless, it ought to be possible to "post" all hospital cases, and the good resulting will gradually

educate the public to a tolerance of the practice in outside cases and then a demand for it will follow. We ought not to wait for the millennium to bring good things, but bring about the millenium by the good things we create. So let's get to work in the matter of finding out what kills so many people prematurely.

**The Insane Criminal.**—"Guilty but insane" is the verdict proposed by the New York State Bar Association Committee which

has been investigating the subject of the proper disposition of the insane who violate the law. What it proposes amounts to a revolution in legal procedures very similar to that suggested time and time again by AMERICAN MEDICINE, but going a step farther.

The Thaw case has at last convinced the lawyers that a person can be a dangerous lunatic and still be able to distinguish between right and wrong; in other words to appreciate the nature of his acts. The old idea that the slightest degree of insanity is sufficient to destroy one's responsibility is declared an exploded theory. The suggested change in the law is based on the fact that insanity weakens a man's inhibitions so that, under provocations or suggestions which the normal resist, he does things which he knows are wrong. It is therefore proposed, if insanity is proved to exist beyond reasonable doubt, to put him under restraint to prevent a repetition of the offense. As we understand the Committee, the confinement is not a punishment in any sense of that word nor is it a reformatory measure, but merely a safeguard to the man himself and to society. If he subsequently recover under the quiet and medical treatment of the asylum, he is to be transferred to a prison and not turned loose to relapse under the strains and excitements of freedom. Moreover this confinement is to be for life, not only in murder cases but also in other crimes partly due to the incurable forms of insanity, and we presume also in the cases of simple mindedness and imbecility. Chronic criminality is largely due to mental defect, demanding state guardianship. At present these unhappy mortals are released after

the sentence is worked out, and promptly commit other crimes thus repeatedly returning to a prison which never restores their mental and physical defects. In many states the recidivists are confined for life whether or not insane or mentally defective. First offenders, of course, are largely curable as they are nearly always victims of a bad environment and yet not so mentally arrested that they cannot be taught self-restraint. Under the new law, the only benefit derivable from establishing insanity is the prevention of execution. In all other cases it will be a dangerous plea for it will bring on life confinement. The word "responsibility" is taking on a new meaning in law, and is approximating the old medical meaning, but the state is now assuming charge of the irresponsible, neither punishing nor excusing them. The public is clamoring for protection and all murderers must be so managed that they cannot possibly kill anyone else. The reign of violence must cease. Public opinion must not be defied by legislatures any longer.

**The Need for a Central Identification Bureau.**—The identification of unknown dead demands more attention the world over, but more particularly in the large cities. Included in this report is the identification of the unknown sick who are so delirious or comatous as to be unable to account for themselves.

Several unfortunate instances have directed attention to the lack of all system in New York City, where it is possible for even prominent men to be buried in Potters' field and no one ever know what became of them. There should be a central identification bureau in the Police Department and we are glad that there is a movement in that direction. If a sick man's identity is not established in two or three hours, a full description of his person and clothing and contents of the pockets should be telephoned to the bureau by the hospital authorities, followed by a written report. In the vast majority of cases a very ordinary detective could locate the man's family or friends in a few hours. In many a case of mysterious disappearance, the family would find the description at the bureau



almost before they began to worry over it. The description of the unknown found dead would of course be instantly telephoned. There is no necessity for any one being permanently lost if he should be stricken down when away from his friends. The medical profession can aid in this reform very materially.

#### **Disagreement Among the Eugenists.—**

A conflict of eugenistic opinion was quite inevitable for it is impossible to be free of error in such a new science.



Dr. David Heron of the Galton Laboratory in London has made an attack upon the conclusions put out from the Eugenics Record Office of Cold Spring Harbor by its director, Prof. C. B. Davenport.

port, and though the wording is unnecessarily violent the controversy is welcome. Hot discussion always indicates a living issue and the heat is in proportion to the importance of it. Davenport had previously differed radically from the theory of ancestral inheritance largely held by the English eugenists—a theory which Mendel's discoveries had proved to be baseless, but he seems to have gone beyond the safety line in his interpretation of the data. Briefly, he claims that weakness of a characteristic is no bar to matrimony providing it is mated to strength in that part. If weakness were a bar, then all humanity would be kept from marriage, for every one is weak in some things—imbecile or even idiotic one might say. Moreover the greater a man's special endowments are, the more certain will he be found to be lacking in other respects. Mathematicians are rarely linguists and great linguists can rarely appreciate simple numbers. Everyone has some talent, small though it be, and is defective in other matters. Indeed, specialization is nature's way of making our small and finite minds supplement each other, and divide up the enormous amount of knowledge and ability needed to preserve and advance civilization. Perhaps it would be harmful if strength were always mated with strength, for then we would be a race of one sided people whose judgments in the affairs of

life would be generally wrong—as is the case with men of great genius in one line. The Galton experts assert that strength should always be mated with strength to advance the race and that inferiority should eventually be kept from breeding.

**Classifying Mental Defects.—**The grading of mental deficiency seems to be the stumbling block over which the eugenists are quarreling.



Davenport has failed to state how far a weakness may go before it can be considered as unfitting one for accurate reasoning. He has unconsciously given the unfortunate impression that he favored the marriage of the incompetent and this seems to have raised the ire of the English workers. He has also stated that a man with a tendency to the milder forms of manic-depressive insanity may have normal offspring if mated with strong mental stock. This opinion will probably arouse strong protest from psychiatrists who have so long been pointing out the alleged transmission of such nervous instability. Davenport seems here to have gone too far. Nevertheless his opinion is in line with the growing mass of proofs that most defects of this nature are non-transmissible results of environmental factors. Offspring may be normal if given a normal environment. It is not strictly eugenics at all, but a correction of pathologic defects due to occasional adversities. Laws of inheritance do not enter into the problem at all. There is then no excuse for the anti-Americanism shown by the Galton Laboratory. It has been under very severe fire itself at the hands of British physicians, whose experience shows them that proper conclusions are not always formed from statistics. The lesson the medical profession may learn from the present controversy is that the science of eugenics is yet too new to draw safe inferences from the data at hand. There are such a multitude of factors modifying the organism before birth, as well as after, that it will take a long time to determine which modifications are permanent, and which are so severe as to unfit for procreation.

# ETOLOGY AND DIAGNOSIS



**The Use of Tuberculin in the Diagnosis of Obscure Conditions in the Genito-Urinary System.**<sup>1</sup>—Dr. Edwin Beer of Mount Sinai Hospital has called attention to the diagnostic value of tuberculin when other methods of diagnosis have failed, and there are no contraindications like advanced tuberculosis of the lungs or other parts, nephritis, etc. He uses imported "alt tuberculin." This is diluted, so that five drops are equal to  $\frac{1}{2}$  milligram.

R

Old Tuberculin	0.05
Trikesol	0.15
Distilled water qs. ad. 30.00 c.c.	
S. M. V = 0.0005 old tuberculin.	

This is kept on ice when not needed. Injections are made only in nonfebrile cases, the temperature being taken regularly every four hours for several days prior to the injection. Five minimis is the initial diagnostic dose, and only in case of a negative reaction is a larger dose permissible. Under such conditions, the dose may be gradually increased,  $\frac{1}{2}$  milligram at a time, up to a maximum of 5 milligrams. In children a much smaller initial dose should be used (1/20 milligram). This increase should be gradual, allowing at least two to three days, preferably the latter, between injections. A positive and useful reaction is made up of at least two series of symptoms, and, in some cases, of three. There must be a general febrile reaction, with all the symptoms of fever, usually of a low grade and transient. Secondly, there must be a distinct local reaction at the point of tuberculous disease, as evidenced by either spontaneous pain or increased local tenderness. Thirdly, in such cases as permit of such an eventuality, there may be a marked increase of tubercle bacilli in the discharge (urine), or they may appear there for the first time. The injection is made in the arm, subcutaneously, in the early part of the day, and the patient being in bed, the temperature is to be taken every two to four hours. If a general reaction (not too severe) is produced without a focal reaction, which is a frequent occurrence, the same dose should be repeated and it may then evoke, in addition to the general, a focal reaction. Koch thought the fact that the general reaction to the second, but identical, dose, was more marked than to the first dose was an absolutely reliable sign of tuberculosis.

There are very few, at the present day, who will deny the specific action of tuberculin. From year to year the evidence is accumulating that points to but one conclusion. If one sees wounds in which there is firm union over a small tuberculous focus, such as is left in the

vas deferens after castration for tuberculosis of the epididymis, break open directly after the use of too large a dose of tuberculin, the specific action of this agent becomes very manifest. Such an effect I have seen following a castration for tuberculosis at a time when the wound had been thoroughly healed, and again under similar conditions after a nephrectomy for tuberculosis, in which the reaction developed in the remaining tuberculous ureter.

On the other hand, it cannot be doubted that certain cases of tuberculosis, as mentioned above, may not react to tuberculin. Whether maximum doses in these would produce a reaction, one cannot say. Petruschky goes as high as 10 milligrams. Others (Mohr) up to 20 milligrams. There are some (Mohr) who think a negative response excludes tuberculosis, but to this I am not at present willing to subscribe. *A general plus a focal response is practically invariably due to a focal tuberculosis, and such a response locates the diseased area. A general minus a focal response is of no practical value, as the most careful examination cannot exclude tuberculosis in other parts which may give the general reaction.*

All the more recent evidence goes to show that this drug is not dangerous when used carefully and under the restrictions mentioned above. Still in the earlier and occasionally in the more recent literature we find warnings against the use of this drug. Heubner, for instance, thinks he saw two cases of miliary tuberculosis develop after its use, and Foss has reported a hemoptysis. It is of course difficult to say that these cases did not have their miliary tuberculosis at the time of injection. Still such accidents are theoretically possible, as we know how powerful the drug is as an irritator of tuberculous lesions, and to avoid such accidents great care should be taken, as was suggested above, in recommending Diem's procedure of a preliminary von Pirquet test.

**The Diagnosis of Arteriosclerosis.**<sup>1</sup>—Dr. Louis Faugeres Bishop of New York discusses the difference between the essential disease of the arteries (arteritis or endarteritis) and the general degenerative disease of the whole body which he calls arteriosclerosis for the want of a better term. Atheroma, as shown by calcareous deposits is entirely different and almost physiological in its development. He says:

"The attempt to include the general degenerative disease, arteriosclerosis, in the group with endarteritis, leads to an attempt to explain symptoms on a purely mechanical basis, while, in fact, the symptoms are only explainable on the basis of biochemistry."

My own theory as to this disease that is carrying off so large a proportion of those who die at the present time, is that it is due to sensitization of the cells to particular proteins, either of food or bacterial origin, the continuous action of which leads to progressive damage to the cells.

The therapeutic test is a valuable aid in diagnosis. If an individual, with a blood pres-

sure in the neighborhood of 200 mm. Hg., precordial pain on exertion, albumin and casts in a urine of low specific gravity, profound depression of spirits, high hemoglobin and some numbness of one-half of the body or slight aphasia, who is put upon a low protein diet, subjected to a phlebotomy, compelled to exercise, deprived of his salines, and given suitable treatment of the intestines, does not make a comparative recovery, I am inclined to believe that he is suffering primarily from endarteritis, disease of the kidneys, or other localized organic disease. But if such a subject does make a comparative recovery, in that his blood pressure falls to his optimum pressure, he recovers from his depression and cardiac pain, and he is able to resume his normal occupation, I am confirmed in the belief that he is suffering from a degenerative disease of the whole body, of metabolic origin and, under suitable supervision, no account need be taken in the diagnosis of the bugbear of progressive sclerosis.

A recognition of this matter and the proper appreciation of its relation to mortality would do more in one minute to prevent the great increase in deaths noted above, than the endarteritis idea will do in a thousand years. A plea is made here to those who treat degenerative disease to take a broader view of cardiovascular disease, when making a diagnosis, than is comprised in the mapping out of pathological changes."



**The Rontgen Treatment of Eczema.**<sup>1</sup>—Very numerous operators have called attention to the value of X-rays in the treatment of eczema, although there has been no monograph descriptive of the details. Dr. Mulford K. Fisher of Philadelphia says:

The employment of the rays requires a tube of very low penetration, and a minimum amount of current, only sufficient to illuminate the tube slightly and with scarcely any penetrating power. To some extent here we must be governed by the character of the lesion, whether acutely inflammatory or chronically thickened and scaly. To quote Sir Malcolm Morris, "the fundamental principle which should guide the practitioner in the treatment of eczema is to soothe when the inflammatory process is acute and stimulate when it is chronic," applies very well here. In the former instance only the mildest sort of treatment is permissible, the tube at some distance from the part treated, eighteen to twenty-four inches, and the seance of only short duration, five to six minutes. Where the lesion is more chronic, or of a squamous character, a stronger light

in the bulb is desirable, the part treated is brought closer to the tube and a longer exposure required, ranging from ten to fifteen minutes.

The effect of the rays as a remedial agent in eczema is most probably due to the low vitality of the diseased cells, which are destroyed by the action of the rays, while the normal healthy cells of the part are mildly stimulated. No X-ray dermatitis should result from the application of the rays in the treatment of eczema. Personally I find that better results are secured if treatment is given frequently, every other day, this exposure to be of short duration, rather than giving longer treatments at wider intervals.

It must not be understood that constitutional treatment is to be neglected if the Röntgen treatment is to be carried out. How much this may be regarded as a metabolic disease is questionable, but hygienic measures, if necessary, proper regulation of the diet, if indicated, and the removal of any form of local irritation are all necessary adjuncts to the local methods of treatment. However, this series of cases is practically all among patients who had been under treatment by other measures before receiving X-ray treatment, and were referred for the reason that persistent drug medication had proven of no avail. The fact that improvement was noted simultaneously with the beginning of röntgenization would point to this agent as the potent factor in securing the favorable result.

**Treatment of Pruritus Vulvae.**—Stein (*Urologic and Cutaneous Review*) lays stress on the fact that neither water nor alcohol should be used in the preparations prescribed. The writer forbids patients to bathe, wash, or douche the affected parts until after the condition has improved. Instead of water he advises the application of olive oil, to be carefully repeated after each act of urination or defecation. This should be followed by the use of an ointment:

$\text{Rx Cocaine,}$ $\text{Mentholis,}$ $\text{Acidi salicylici,}$ $\text{Adipis lanæ hydrosi,}$ $\text{M. ft. unguentum.}$	} aa gr viiss (0.5 grammes); } 3 iss (50 grammes).
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This should be applied in a thick layer on gauze, which is to be held in position by a T binder. To relieve itching, the placing of an icebag in contact with the parts, to remain over night, is also often effectual.

If causes such as diabetes, icterus, circulatory disease and parasites can be excluded, and if there is fluor and hypertrophy of the cervix, curettage and if necessary amputation of the cervix should precede the use of the local measures already referred to.

It is of great importance, also, to see that the patients have sufficient sleep and to relieve their extreme nervous excitability. Hypnotics may be used for the night, while during the day the following bromide mixture may be given:

<sup>1</sup>Med. Record, Aug. 30, 1913.

R Potassii bromidi, } aa 31 (4 grammes);  
Sodii bromidi, } 31 (8 grammes);  
Ammonii bromidi, 31 (200 grammes).  
Aqua destillatae, q. s. ad 3vii (200 grammes).  
M. Sig: One tablespoonful three times a day.

**Vaccination for Typhoid Fever.**—Vaccination, preventive and curative, is now largely employed in France for typhoid fever. All the doctors have received official circulars drawing attention to this new and, as has been proved, effective treatment and stating that a supply of vaccine is at their disposition when necessary.

As a preventive this vaccine will become in time as popular as the Jenner vaccine, and will be freely used for children and adults in periods of epidemics. Last summer a severe outbreak of typhoid fever occurred in the town of Avignon; nearly half the population was vaccinated with the result that the epidemic was stamped out. Naturally severe hygienic measures were taken also.

As to the counter-indications, the antityphoid vaccine should not be employed in subjects suffering from any acute or chronic affection; coryza, grippe, tonsillitis, bronchitis, pulmonary or febrile gastric affections, enteritis. Among the chronic affections may be classed tuberculosis, malaria, syphilis, cardiac and renal disease, diabetes.

Generally, says Army Inspector Dr. Schweider, it would be well not to choose a moment of mental fatigue (studies for examinations) or where the patient is debilitated or at the menstrual period of women.

The vaccine is delivered in ampoules of 2, 5, 10 and 20 cubic centimetres. Each ampoule contains a label indicating its origin and the date of its manufacture. The vaccine must be kept in a cold place and away from the light, in this way it maintains its effect over three months.

The syringe used may be that of Pravaz or Luer, but of a capacity at least of two and a half cubic centimetres.

The seat of injection is the left shoulder (the right in left-handed persons) behind the posterior edge of the deltoid and two fingers' breadth above the axillary fold. The skin is first painted with iodine, and the liquid injected slowly beneath the skin, under the aponeurosis or into the muscle, and the patient recommended to keep his arm quiet for two hours.

The vaccination requires four injections at intervals of from seven to ten days at the following doses:

- 1st injection, half a cubic centimetre.
- 2nd injection, one cubic centimetre.
- 3rd injection, a cubic centimetre and a half.
- 4th injection, two cubic centimetres.

For children these doses will be reduced by one half. A drop of tincture of iodine seals the little orifice.

Although the patients need not interrupt their occupations, certain precautions should

be taken, as abstention, the day of inoculation, from all fatigue or excess in eating and drinking. They should be made to understand that they should not consider themselves as immunised until they have received the complete series of injections, and not before twenty days have elapsed since the last injection.

The best time of the day for the injection is from four to six in the afternoon, as if any reaction took place it would pass away unnoticed during sleep.

The duration of the immunisation is not, at the present time, definitely fixed, but it is supposed to cover two years and a half.

As curative treatment, the vaccination influences favorably the course of the malady when employed in the early stage and provided that the spleen is not too much enlarged. Preference should be given to autovaccine, but this is not easy to obtain; the choice rests with the hetero-polyvalent vaccine of Wright. Under its influence the fever goes down slowly but progressively, and convalescence is less prolonged.

## GENERAL TOPICS

**The Doctor and the Automobile.**—From the way doctors take up the automobile, says a writer in the *New York Times* (Nov. 10) it may be well concluded that as a business proposition passenger cars hold their own against any other mode of transportation. To prove this, a few instances may be quoted, in which physicians using automobiles have kept exact cost records, given below. In reading these it should be remembered that the care spent on the car and the tendency to economize influence maintenance cost figures materially, and that the wide fluctuation in the cost to the mile, for instance, is dependent as much on the quality of the driver as on that of the car. Of course, the more powerful a car is used the higher becomes the cost per mile of travel.

Physicians whose work is mostly done in the city are appreciating the advantages of electrics. A well-known Brooklyn doctor, for example, who used gasoline cars from 1900 to 1912 is now user of his second electric brougham. In 1910, when he used a gas car, he covered 10,000 miles. His cost for this, including garage, fuel, tires, insurance, depreciation and interest, repairs and chauffeur's pay, was \$3,800, making the cost of each running mile 38 cents. All this mileage was made in and around New York City, as he did not tour to any extent. After having about the same expense to the mile in 1911, the doctor decided to try an electric, which he bought early in 1912. During that year he not only saved the \$1,200 of the chauffeur's pay, but

also \$700 in other ways, so that his total expense, with about the same mileage covered, fell to \$1,900, which, however, is quite high for electrics. The doctor is now a convinced advocate of the electric for town work, and says that, except in heavy snowfall, it is as good a vehicle as he could wish for.

Another physician has used the same sort of electric for the last two and a half years, and for about 7,000 miles his expenses have been \$1,900 all told. The cost of 27 cents per mile was due to the fact that the car was used less than it could have been. To give a clear idea of what makes up this cost of maintenance, it should be remembered that an electric may be bought for about \$2,300, and its life may be rated, conservatively, at five years. Thus the annual depreciation would be figured at \$460—20 per cent.—the interest at 5 per cent., or \$115, and the flat maintenance rate charged by New York City garages for current, washing and other care, at \$45 a month, or \$540 a year. This makes \$1,115 a year, and adding \$85 for insurance and extra expenses, including a small repair now and then, we find \$1,200 a year a good average maintenance cost. If the car is used to its full running capacity on the current furnished by the garage at \$45 a month, a mileage of 25,000 may be covered in a year, and the cost to the mile is 5 cents. If only half that mileage is made, or about 1,000 miles a month, the cost to the mile is 10 cents.

Doctors in the suburbs find the cost of automobiles even lower than this conservative estimate. The case of a Jamaica physician using an electric in a small garage of his own shows the following result. During three months 1,200 miles were covered and the sole expense was \$35 for current, or less than 3 cents a mile. If the garage and rectifier cost, as well as depreciation and interest, are added, the real cost to the mile is brought to 5 or 6 cents. The same physician used another electric for two years ended April last, and his total expense for 6,000 miles was \$250, or 8 cents a mile.

In a Jersey suburb, another car of this type is used by a physician. During four months of its use this car covered 1,600 miles, the total cash expenditures being \$20 for current and \$5 for small repairs, or 1 1-3 cents per mile. Including all other charges, the total cost to the mile was not more than 4 cents. However, the electric does not stand alone as the physician's vehicle. Among the many instances of economically operated gas cars, there is a thirty horse power car working in Queens County. In three years it has covered 17,000 miles, used about 1,450 gallons of gasoline, and cost its owner \$1,200 (direct expense) during thirty-four months of operation. So he directly paid 7 cents a mile for the use of his car, but if depreciation and interest are considered, the cost a mile was 15 cents. During the last twelve months the direct mile cost was only 6.5 cents.

Another machine of the same make, operated in the city for eleven and one-half months, covered roughly 16,000 miles in that time.

Using almost 1,800 gallons, the cost of operating the car was approximately \$2,400, exclusive of depreciation and interest. Without these, the cost per mile was 15c.; with them, about 22c. One car used in New York City for a little more than twenty months, covered 8,120 miles, at an expenditure of \$1,460, approximately. In the year from July 1, 1912 to July 1, 1913, the direct expenses, including the purchase of new accessories, were about \$960; after adding \$500 for depreciation, the total cost of maintenance for that year was \$1,460, and, as the car made 5,050 miles, 28c. for each mile.

In the case of still another gas car, used for two years, 24,000 miles were covered in the city, excepting one or two tours of about 800 miles each. Two thousand gallons of fuel were used during that period, and the total expenses were \$990, exclusive of the chauffeur's pay, which amounted to \$2,810. The physician owning this car prefers a chauffeur, but as many physicians would drive themselves, these figures may be considered from their standpoint. To the \$990 should be added depreciation and interest, making the cost \$1,990 for two years. The cost to the mile is then a little more than 9c. Including wages, the total cost for two years was \$4,800 and the cost to the mile 20c.

Of course, a car may be maintained more expensively. One doctor runs about 12,000 miles a year; he figures that it costs him \$6 a day or 18 cents a mile, without depreciation and interest charge. These included, the cost to the mile is 24 cents. In half a year the same physician also keeps another machine averaging 2,000 miles a month and costing \$10 a day. To this the dead storage for half a year must be added. Everything considered, this car costs 21 cents for every mile of travel.

The example of a car which covered 30,000 miles in the last three years is interesting. The total cost of operating it during this period was \$4,710, or a little less than 16 cents a mile. In the past year it covered 12,000 miles. The total expense was about \$2,310, and the cost to the mile close to 20 cents. This car makes from ten to thirteen miles to the gallon.

**Does the Anglo-Saxon Bathe Too Often?**<sup>1</sup>—Nowadays, what with our intense and unswerving interest in the preservation of the race or rather in that part of it which we think needs our many ministrations to prevent the slightest lapse into the ways of the careless, a new chapter has been written on the subject of when and how to bathe, the temperature of the water that may prolong life, and especially what soaps should be used and what soaps should be shunned. We take it this interesting agitation got its cue from those weighty words of Sir Almroth Wright, the gist of which was that frequent bathing was weakening, that the use of soap was a habit that had no virtues, in short, that by encouraging, or rather by overdoing the act of bathing, we were inviting all sorts of diseases to enter

<sup>1</sup>Editorial *Interstate Med. Jour.*, Nov., 1913.

our pores, thus converting what otherwise would be stalwart men into those oafs whom Kipling lamented in one of his patriotic poems. Shortly after this remarkable pronouncement, Dr. W. Allan Jamieson's book entitled "Care of the Skin in Health" appeared, and again we were told that the English people are really in a state of ignorance on account of their persistence in using the bath. And now there lie before the writer of these lines two journals—*The Lancet* of September 6th and the *New York Medical Journal* of September 13th—in which considerable space is devoted to soap and the care of the skin. After reading both contributions carefully—the editorial in the English journal on Dr. Frederick Gardiner's article entitled "Soaps and Their Effect on the Skin" issued from the laboratory of the Royal College of Physicians of Edinburgh and Dr. Daisy Orleman Robinson's "Hygiene of the Skin" in the American journal—the thought that must arise in every intelligent reader's mind cannot be other than our own—namely, that although these authors are in favor of bathing and also are quite enthusiastic on the use of soap, there is such a divergence of opinion as to the sort of soap that is to be preferred so that the skin will remain unirritated, and there are views in general so diametrically opposed to those of Wright and Jamieson that perhaps to avoid controversy with one's own physician, not to mention various members of one's family who may have flirted with the dictum "No baths, long life," it were better after all to abandon all thought of keeping the body clean by complete immersion and a liberal amount of soap.

It does seem strange that after all these years of uninterrupted advocacy of the bath by the Anglo-Saxons—and the Americans are included in this category—and after what we have read on the subject of our physical supremacy, due to our cleanly habits, that a propaganda should be started to put very foolish ideas into the heads of the people at large. While it is undoubtedly true that domestic soaps that are used for the washing of clothes would hardly be the sort that one would advocate for the bath, to drag these into the controversy so as to show their bad effect on the skin when used in the bath is a very unnecessary procedure. If it is true that the poor must perforce use these for economic reasons, it is also true that the poor resemble a goodly proportion of rich in not using soap at all. Statistics of personal cleanliness will never be forthcoming, because he who would undertake this Herculean project would not survive for long, either physically or mentally; but lacking statistics can it be affirmed that the quantity of soap used by the average individual in his bath will ever subvert his health? That occupation dermatitis is observed often enough to give us pause, we are willing to admit; but just because this occurs is no reason for launching anathemas at all soaps, and even going so far as to asseverate that if their disuse is not insisted upon a nation will be made up only of weaklings.

But when we consider the bath minus soap, what have not been the opinions set forth to show the utter wickedness of those who plunge into very hot or cold water. And yet we know that the Japanese "steam" every day in hot water and that instead of being physically decrepit they are a very sturdy race. But they are not the only nation that makes a cult of the hot bath, for if we are to believe what is stated in a recently published book—"Finlande et Finlandais," edited by Professor Werner Söderhjelm—another nation has been added to those who already see no harm in steaming themselves daily, who are not obsessed with an eradicable fear that the open air, no matter what its temperature, is not the best means to dry the body after a douche of tepid water subsequent to the steaming, and who really believe that besides its cleansing properties their mode of bodily cleanliness has a therapeutic value. Steam baths are considered an invaluable remedy for a chill or fever, and in muscular stiffness and pain around the joints they have a beneficial purpose.

Whether or not we believe that the foregoing drastic measure should be advocated among all people, or that cold baths have virtues which hot baths can never possess, it is far better to preach the most advanced gospel of cleanliness than none at all. The person who bathes frequently is a cleaner person, both physically and mentally, than he who does not; and, if our desire is to-day to bring about a higher morale among the people at large, let us not cavil at a soap because forsooth it may be a little too strong in alkali or at large quantities of water even though applied to the body oftener than once a day. For let no one think for a moment that human nature is so smitten with the idea to keep clean that it will ever have a mad-dening desire to use too much soap or water.

**Moonlight and Decay.**—The observation that the rays from the moon favour putrefaction detracts from the romance which has long been associated with moonlight. It is an old tradition that to sleep in the moon's rays was a dangerous proceeding, and there is such a thing as "moonblink," a temporary blindness said to be due to sleeping in the moonlight of tropical climates, while some observers have reported a devitalising action of the moon's radiations on vegetable life. There is even quoted a death the cause of which was officially stated to be exposure to moonlight. Apparently the food most seriously affected by the moon's radiations is fish, and seemingly trustworthy statements have been made as to the ill-effects produced in persons who had partaken of fish which had been freely exposed to moonlight. Mr. E. G. Bryant, B. A., B. Sc., writing in a recent number of the *Chemical News* from Port Elizabeth, South Africa, suggests that a possible explanation of these phenomena, assuming them to be true, might lie in the well-known fact that the light of the moon, being reflected light, is more

<sup>1</sup>Editorial *The Lancet*, Oct. 25, 1913.

or less polarised, and possibly polarised light may exert a peculiar chemical action. Subsequently, polarised light was obtained from a powerful metallic filament lamp, the light being polarised by means of a pile of sheets of plate glass backed with silver and placed at the correct angle. The experiments showed certain marked results when fish was submitted to the polarised light obtained in this way, although it is probable that stronger effects would be obtained with a more powerful source of light. When two slices cut from the same fish were hung, one in the direct light and the other in the polarised beam, the latter invariably began to decompose before the former, though the temperature of the polarised beam was several degrees lower than the direct light. There were indications also in the case of other perishable food substances of a tendency to decompose when they were bombarded with polarised light. The question is worth further investigation, and there should be little difficulty in pursuing such a line of research. There are so many influences ascribed to moonlight that it would be of obvious interest to have some scientific evidence tracing a definite action to the rays. It would be curious to find that such terms of obloquy as "moonstruck," "mooney," and "moonshine" were after all not entirely empirical.

**The Health Authorities' Work in the Home.**  
—C. A. Hodgetts states that the most striking example of the work of philanthropic agencies accompanied by the work done by boards of health is the anti-tuberculosis work which was carried on before government or municipal authorities showed any interest in it. But government bodies have gradually been linked together and that which began as a sociological movement is now as much a part of routine health work as the care of communicable diseases, the prevention of nuisances and inspection of plumbing. The cooperation of philanthropic agencies with health boards has accomplished much that formerly would have been impossible. This is seen in better home environment and better hygienic methods in living.

In Canada, up to the present time, the federal government has shown greater interest in agriculture, immigration and the maintenance of militia than in the care of the people, not a dollar having been spent as yet, to save the lives of the infant population. The government has assumed as a duty the oversight of livestock but has done nothing toward the protection of infants. The work of the sanitarian in the home has, as yet been scarcely touched, and the widespread activities of philanthropy for the child indicate the need of systematic work by state and municipal health authorities.

Approximately 25,000 babies die annually in Canada during the first year of life from ignorance, bad surroundings, penury, or criminal neglect. The state assumes the oversight of the

child when it reaches the school age, and the care and treatment of those who are defective or diseased. It also provides, in some instances, for medical attendance, sick insurance, and pensions of the aged, but it has thus far neglected the most important part of the field of preventive medicine, the waste of infant life. The health departments should be so equipped that the child could be cared for and nurtured, during its earliest years. The work of hygiene should be begun at or before birth to prevent subsequent defects and permanent disabilities. Important measures in the conservation of child life are (1) the inspection of the home, (2) the education of the people in all that relates to the life and health of the baby as well as to that of the mother and father, (3) the betterment of environment within and without the home, (4) the oversight of institutions which care for infants whether legitimate or illegitimate.

This work is more important than the building of navies and the training of armies. The results will be so manifest and so farreaching that the nation which engages in the hygiene of the child will continually go on to higher and better things.

In addition to health work in the home the local health authorities should be charged with the supervision and instruction of mothers in the care of babies, the establishment and operation of milk stations, the supervision and control of midwives. They should also supervise and control institutional work which has for its object the care of the infant and the child, the regulation and oversight of child labor, and the regulation and oversight of all industrial work done in the home.

These excellent suggestions are offered by a Canadian for Canada, but they are equally pertinent to all countries. Some of them have already been carried out in this country but the lesson is universally applicable that if we are to do our duty to the state, to any state, for the future there must be greater care for the infant and the child, on the part of the government, than has been the custom in the past.

#### LIFE'S SYMPHONY.

To be thankful for each new day and to put into it and to get out of it all the good I can; to give expecting nothing in return; to help to bear the burdens of others without burdening them with mine; to know enough of sorrow to be able to sympathize; to know enough of sin to direct others into right paths; to be blessed with enough of this world's goods to be satisfied with what I have; to look to Nature for my spiritual lessons and my daily sermons; to take care of the present, and to let the past and future take care of themselves. In other words to live each day as though it were my last. This is the philosophy of my life, the symphony of my soul.

# American Medicine

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and

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PUBLISHED MONTHLY BY THE AMERICAN MEDICAL PUBLISHING COMPANY.

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Complete Series. Vol. XX, No. 8.  
New Series, Vol. IX, No. 8.

MARCH, 1914.

\$1.00

YEARLY  
in advance.

**The growing opposition to vaccination** is a matter of grave concern. This new movement, if it may be dignified as a movement at all, is not the illogical and absurd anti-vaccinationist crusade, but is the conviction on the part of very intelligent men that it is useless to protect against an infection which they may never encounter. They acknowledge that a proper Jennerian vaccination is a life long preventive and they also state that if their children are to be subjected to danger of acquiring smallpox they surely would have them vaccinated. Their only argument is that there is some danger attending vaccination—an occasional pus infection or very rarely tetanus—and that the risk is more than the risk of getting smallpox! This attitude is not confined to laymen, but is taken by those leading men in the medical profession who postpone vaccination of their own kith and kin until the last moment. Two world renowned men have confessed to us that they have had their children vaccinated only in obedience to public opinion in and out of the profession. The worst of the matter is that the profession as a whole uses exactly the same arguments in advising patients not to take any other prophylactic until the necessity arises—antitoxin of diphtheria for instance. Doubtless we could immunize everyone against plague and cholera, but what's the use if plague and cholera never

come here? So we hear men saying that there is not one chance in a million of their children being infected with smallpox but that there is far more chance of a pus infection or tetanus from the vaccine. This would be sound reasoning if it were certain that the child would not suddenly be brought into contact with smallpox, for this is just what is happening everywhere, and the loss of life is thousands of times more than from vaccinia. In time we will make the operation absolutely safe, and this objection will disappear. In time also we will exterminate smallpox and vaccination will be unnecessary, but to bring about this desirable state, we must appeal to everyone to do their share for the public good. At present the disease prevails practically all over this country, but it is never seen in Germany except as an importation.

**Unnecessary revaccinations** are the besetting sin of many health officers. It seems to be a rule that when a case of smallpox is discovered, all who have come into contact with it, even remotely, must be vaccinated whether they need it or not. We do not vaccinate the nurses in a fever hospital as every new case is admitted, for we acknowledge that they have been immunized. Health officers are giving new arguments to anti-vaccinationists who assert that we are really doubtful of the lasting value of

vaccinia. As a matter of fact the great majority of such contacts may be wholly immune and it is a work of supererogation to repeat the operation unless a long time has elapsed. Reasonable discrimination should be exercised, and those who present proper scars should be considered protected and excused, particularly if they have been successfully vaccinated twice in their lives —once in infancy and once in adult age. It is generally argued that no harm results, and that it is better to be safe than sorry. There is a slight risk, nevertheless, and we tempt some to run away who may really be in need of it. There is also a temptation to carelessness, for a failure is universally interpreted as proving that the person is already immune, whereas it may be the fault of the material or the operator. Vaccinators should strive to be successful in every case for if they fail it is apt to be held up against them as an instance of a wholly unnecessary operation. There is entirely too much time, money and material wasted this way, and in addition there can be little doubt that the growing opposition to vaccination would be largely checked if the public were convinced that a revaccination is not a gamble. Parents now delay the primary vaccination of their infants to a dangerous extent and everything we can do to end this carelessness will lessen the necessity for a wholesale rounding up of contacts every time a case occurs.

**The question of compulsory vaccination** is sure to come up soon, and we must be prepared to check a movement which is bound to jeopardize many lives. England has been noted for the greater personal liberty enjoyed by its "subjects" than "free-born American citizens" give themselves. No English child need be vac-

cinated if its parents have conscientious scruples against the operation. As a consequence a very large unprotected population has grown up, nearly equal to or even outnumbering the protected, as in Leicester where 75 per cent. are said to be unvaccinated. So far there has been no great disaster, but from the experience of Canada, which was grievously scourged a generation ago because it allowed a large unprotected population to grow up, we can safely predict a dreadful reckoning in England. It may be all right to assert that this is nature's way of eliminating the fools who haven't sense enough to live in modern crowds, but among the dead will be many who have been deceived by men who were considered experts worthy of belief. Those who openly oppose vaccination or who tell everybody to wait until they come to the bridge of danger before crossing it, are taking a heavy responsibility on their souls. The only comforting thought is the assurance that if we protect ourselves, the unprotected will not harm us or our children. Compulsory vaccination is not for our sakes but for the sake of those who have been unlucky enough to get bad advice and alleged facts from the wrong sources. From the frequent reports of smallpox in this country, we are safe in saying that the unvaccinated have made it endemic and that a child is liable to be infected in journeys or in crowds. What can we do to stop the carelessness? Publicity in lay journals would help.

**The indiscriminate use of antitoxin** is another evil which has been wisely corrected in many hospitals. The nurses very properly objected on account of the untoward results which now and then laid them up, and it is now the rule to inject them only

when the bacilli are found in their throats. When diphtheria is found in a family, we are very prone to give every other inmate of the house an immunizing dose, and perhaps this is the wisest thing to do even if we are convinced that some of them do not need it. The risk is believed to be too great for hair splitting. Nevertheless, not a few practitioners have reported that blood relatives of the patient do not get the infection nearly so often as we would think from the close contact between them. It is therefore an interesting point to look into to determine whether these immunizing doses of antitoxin are doing as much good as we have been led to believe. The failure of antitoxin to cure carriers would tend to cast suspicion on its efficacy except in those who have so far lost their immunity as to develop diphtheria. It is very far from our intention to throw suspicions on such an invaluable remedy, but it has proved so valuable in its place and so useless out of its sphere that thoughtful consideration is needed. If the staphylococcus finally proves to be as efficient in driving out diphtheria bacilli as the reports indicate, it would be reasonable to use it for prophylaxis in lieu of antitoxin after we have found a culture and strain that will cause no inflammation of the mucous membrane. Antitoxin has greater dangers it seems, and we have heard that it has been accused of activating latent tuberculosis, so we may finally come to restrict its use to the cure of actual cases of diphtheria. The staphylococcus is declared to be our natural guardian against invasion, and if so it should be used when invasion is threatened, and not an artificial army of antibodies or antitoxins whose work never begins until invasion occurs and the war is on. Even a mild pharyngitis

set up by staphylococci would be no bar to its preventive use, for that is less dangerous than some of the things laid to antitoxin thus used. We know of one nurse who was unnecessarily given typhoid vaccine, Jennerian vaccination and a protective dose of diphtheria antitoxin, all within a few weeks and she has not been well since. This is criminal and the nurses will soon "strike" if we continue such practices.

**The alleged exaggeration of the therapeutic value of all vaccines** is the charge made by a sub-committee of the Council on Pharmacy and Chemistry of the American Medical Association and published in a series of articles which have appeared in the Association journal. The Committee is particularly severe on the stock vaccines. In this new method of cure as in every other that has ever been suggested, the enthusiasts have made claims which have subsequently proved to be incorrect though apparently based on reliable evidence, but as a rule these are minor matters which correct themselves. The Committee has given a strong impression that in its attacks it has gone to the opposite extreme and is really destructive of proper therapy. Its remarks have given rise to considerable indignation, so that their dictum cannot be accepted as final, but merely the opinion of five doctors out of the many hundreds of thousands in Europe and America. In fact the exact role of each of the numerous vaccines will not be definitely known for a decade or longer, but their sphere is surely enlarging rather than the reverse. The attack on stock vaccines is particularly unfortunate because these are the only ones available to the vast majority of physicians or ever will be available in rural practice in sparsely settled districts, and the trend of

experimental work is in the direction of perfecting the stock cultures. To be sure autogenous vaccines are preferred because so far they seem to be best, but the excellence of many of the others is too well attested for such intemperate condemnation. The father of vaccine therapy, Sir Almoth E. Wright, makes and sells stock vaccines to help support his hospital wards. We can rest assured that they must be efficacious or he would not make them and advise their use. The Council approve of typhoid inoculation to cause immunity, although the British Army committee after eight years investigation reported that this vaccine does not give any immunity at all to those who are the most susceptible, and in others it generally fades in less than two years! From this we are justified in assuming that the Council have not sufficiently investigated this whole subject and their report is therefore open to more or less question. The attempt to make their report an official expression of the views of the medical profession must be met with unqualified condemnation. It is officious rather than official. Even Friedmann's vaccine is now receiving great praise in Germany, and Ehrlich declares it harmless though fatalities have resulted from occasional contaminations. If these are to cause its rejection, we must also stop vaccination against smallpox because its vaccine is occasionally infected.

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**Public ignorance of the value of minute doses of tuberculin** is one of the startling bits of news of the last month. For twenty years our own Trudeau has been persistently saying that it is of great use in proper dosage, but few heard him as the profession was obsessed by the idea

that it was bad in all doses simply because it was invariably fatal when we gave several million times too much. This attitude was more foolish than to condemn quinine because a hundred times a medicinal dose will kill a man. A few years ago the Army Medical Department officially frowned upon the use of tuberculin even for diagnostic purposes, upon the strength of an adverse report of Col. Geo. E. Bushnell. At that very time the best sanatoriums of Europe were getting magnificent results with doses of a millionth of a milligram in the early stages. Cases so treated had more permanent "cures," and if relapses occurred they were delayed. More men could return to their usual employments. It is now reported that in these minute doses, it is eminently successful in the early stages of surgical tuberculosis—as an adjunct to other treatment of course, and not as a sure cure of itself. Lay journalists who make a point of keeping in touch with medical advances had never heard of the gradual rehabilitation of tuberculin, though the giving of a potent drug in such minute quantities was a very good "story." Evidently we do not publish enough in lay journals. It is interesting to note that the immunity we all possess is believed to be due to the auto-vaccination of our own lesions and that this process begins in infancy and continues through life. Rivière (*British Medical Journal*, Jan. 24, 1914) calls attention to the fact that very slight lesions can do this. Hence the amount of tuberculin or allied substances which confer immunity must be still more minute than those used therapeutically. We are beginning to think in ridiculously small terms and perhaps it might be well to see if other vaccines and serums are not given in doses too large.

**The benefit of feeding infants on raw milk from tuberculous cows** is the latest suggestion in the discussion as to whether we should sterilize or pasteurize doubtful milk or give it raw. We have become so obsessed with the idea that tuberculous milk is a great danger, that it almost takes one's breath away to learn that it may be necessary to confer immunity on infants that way. Yet that is what Clive Rivière recommends in the *British Medical Journal*, Jan. 24, 1914. Mr. Robert Mond has also been studying the matter at Coombe Bank, Sevenoaks, and at the Infants' Hospital, Vincent Square, London, and has startled everybody by the announcement that children fed on raw milk from cows subsequently found to be tuberculous remained healthy, while all the tuberculous children had been fed on sterilized milk! The first explanation was to the effect that heat so altered the digestibility of casein as to interfere with nitrogen nutrition and that the child, though fat, could not manufacture those nitrogenous antibodies necessary to make it immune to the human tubercle bacilli it encountered. Sir Almoth Wright called attention to the scurvy of children fed on boiled milk and explained it as due to the precipitation of the lime and magnesium salts and the consequent loss of coagulability. He suggested that possibly some such process was responsible for the alleged defect of nutrition which prevented the normal development of immunity.

**The controversy over pasteurizing milk for infants** is therefore shifted to entirely new grounds. On the one hand we have the indubitable fact that it has enormously lessened the summer death rate of infants. The tuberculosis death rate has also diminished, but as it always goes down

when other diseases are reduced, it is a secondary phenomenon not necessarily directly due to prevention of infection by sterilization of the milk. We may have been deceived into the belief that we were preventing bovine infections. A respectable number of men whose opinions are worth quoting, are quite convinced that bovine tuberculosis is too small in amount and too mild in form to worry about, while an equal number equally respectable are loud in their assertions that it is a great danger, affecting from 5 to 20 per cent. of all cases of tuberculosis of children and ninety per cent. of cases of cervical tuberculosis. The latter group wish to slaughter all tuberculous cows and in the meantime pasteurize all milk even the certified. They are opposed by those who are inclined to think that all cows are tubercular in the same way that all men are. That is, they believe that each species of animals has developed a tolerant immunity to a few organisms. By constant auto-vaccination from his own tiny lesion, man develops an immunity to virulent invaders and so does a cow. When a herd becomes actively tubercular it is a proof, not that they have been recently infected, but that the old lesion has taken on activity from bad management, such as improper barns, insufficient outdoor life, too frequent pregnancies, and poor feeding. We may learn that a tuberculous cow is just as harmless to other cows as a consumptive man is to other men, and some veterinary von Pirquet may soon discover a bovine tuberculin test to show us how soon the new born calf becomes infected.

Those farmers who have checked the wholesale slaughter of tuberculous cows may have right on their side, after all, though they certainly did raise our ire at first.

**The milk of tuberculous mothers helps to immunize their offspring,** and that has been a stock argument in favor of feeding tuberculous cow's milk to calves and human infants, but Rivière goes a step further and actually hopes the infected milk will give a child a mild bovine infection which by auto-vaccination will more quickly and more safely immunize it against the human bacillus later encountered, in the same way that Piorkowski tries to immunize us with a turtle vaccine artificially. When we catch our breath from all these astounding changes of opinion, we will perhaps go on pasteurizing milk in summer to prevent other infections and give our babies raw milk in winter. In time, of course, milk will be so safeguarded that pasteurizing will not be necessary even in the hottest weather. It is now known that heat kills more infants than bad milk, and if we could only keep the babies cool, perhaps pasteurizing would not be as necessary as we now think, (see Schereschewsky, Heat and Infant Mortality, *Public Health Reports*, Dec. 5, 1913). At any rate the profession seems to be veering around to the old opinion that babies must have raw milk if they are to thrive and develop normal resistance to the millions of enemies surrounding them. If it is really true that milk from tuberculous cows is not only harmless but actually immunizing, why not pass a law that only that kind of milk shall be sold? Recent advances have certainly placed sanitarians and pediatricians in a paradoxical position. How will they wriggle out of it?

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**The cross-infection of children in New York hospitals** seems to indicate a serious state of mismanagement. The recent

report (section v.) of Mr. Geo. McAneny, president of the Borough of Manhattan and Mr. Geo. Cromwell, president of the Borough of Richmond, who constituted the committee appointed by the Board of Estimate to investigate the city's hospitals, makes grave charges of this nature and supports them by specific instances which are rather shocking—to say the least. Children are placed within the "danger zone" of the other diseases with no protection against droplet infection, convalescents who are still carriers are allowed to associate with the well, healthy children are admitted to hospitals with sick mothers and contract serious diseases from other children, many are kept in the hospitals entirely too long, cross-infection is frequent and seventy-seven percent of acute surgical cases develop complications. Pulmonary tuberculosis, erysipelas, whooping cough, vaginitis, mumps and chicken-pox "are scattered throughout the hospital to the imminent danger of other patients," and "epidemics sweep through the wards." In view of the fatal nature of these infections in very young children, the system is nothing short of murder. Of course there is the usual cry of insufficient room, equipment and nurses, but the committee blames the authorities for not making the needs sufficiently known. Nevertheless, it looks as though there was criminal mismanagement with the means at hand. The superintendents are evidently not sanitarians and need supervision by some capable man with power to act. "In some of the hospitals sick children are obliged to look upon the suffering and death agonies of other children" or are placed near adults with raving delirium. This of course is inexcusable. It all sounds like the hospital conditions of the middle ages, when every hos-

pital parturition was fatal. Some one is needed to bring the methods up to twentieth century standards. Perhaps the money used on useless elaboration of sanatoriums would help to remedy the appalling conditions elsewhere.

**Criticisms of the radium treatment** are almost as intemperate and ill-founded as the popular claims in its favor. Radium seems to have cured superficial epitheliomas, particularly of the skin. At least, they have disappeared and have not returned in so long a time that we are justified in believing they have been destroyed. These cases have been under observation six or eight years and the facts are well known. It is amazing then that Prof. Ernest Schweninger of Munich, formerly private physician to Bismarck, should attack the use of radium and declare it merely a palliative, no better than other inadequate means at our disposal and positively dangerous to surrounding healthy tissues and organs. He is right in denouncing the "madness" of considering it the long sought cure for all cases, but he seems to be too old to accept new and revolutionary things. Another old German professor, Billroth, is credited with having denounced the "Lister swindle" fourteen years after the new surgery had proved its usefulness, so we must expect unreasonable opposition to radium. Perhaps the attacks will neutralize the unwarranted claims. We can find good in everything if we search long enough. Still we would be better off if we did not have to look so hard for the good in such things as the attacks on new therapeutic agents. Men are prone to let their enthusiasms run away with judgment, so it is just as well to have doubting Thomases bring us back to an anchorage on solid facts.

The new pure food decision of the United States Supreme Court, permits the use of poisons in food if they are not to conceal defects and are not in sufficient amount to injure health. No preparation can be prohibited merely because it contains poisons. This interpretation of the law has given great offense in some quarters, but it was the only action possible, or we would be deprived of smoked ham because it contains creosote. The original mistake was in the interpretation of the data supplied by "poison squads." Some of the ablest toxicologists in the world have decided that the evidence did not prove anything one way or the other, or, at least, that if the small amounts consumed were harmful, the damage was too slight to be detected. The policy was adopted of presuming that certain things were harmful whereas they might have been as harmless as the minute quantities of creosote we have been consuming for years. There is no cause for the pessimistic utterances as to the destruction of the effectiveness of the law. The statute is not altered in the least, since the decision distinctly states that harmful things are still prohibited, only the prosecution must prove injury. Similarly the concealment of defects is illegal. There are plenty of bad things going on which should be prohibited, and we need not worry over the trivial. If the law gives manufacturers the opportunity to use too much poison, it should be recalled that the Supreme Court has decided that corporations can be legally deprived of the power to do harm. We prohibit the carrying of concealed deadly weapons on this principle, but we must not so stretch it that no one can carry a penknife. We cannot bring the millennium at once, and we must be satisfied with tiny steps in that direction.

**The prevalence of typhus in the United States** is discussed by Dr. John F. Anderson, P. H. S., in an able article (*Journal Amer. Med. Assn.*, June 14, 1913) which deserves more than passing notice. He shows that the weight of evidence indicates that Brill's disease is typhus, though there is still some doubt expressed by others and we understand that the discoverer himself is not yet convinced that it is typhus. It seems remarkable that this usually virulent infection should take on so mild a form as to be unrecognized in the vast majority of cases and classed with the typhoids as a rule, and this fact is certainly in favor of it being a separate disease as Brill suggests. Yet it might have always been the rule for this fever to be mild as an endemic but to become virulent now and then through factors not now understood. Anderson calls attention to the fact that it might become virulent here and that there is urgent need for us to distinguish the cases to find out exactly how prevalent it really is. Roger Lee of Boston is quoted as finding that nearly two per cent. of typhoids are really typhus, but from the large number found in New York hospitals when looked for, Anderson is inclined to place the percentage much higher. He suggests guinea pig experiments in all fevers resembling typhoid but which are proved to be neither typhoid nor paratyphoid. The difficulty of making a correct diagnosis in paratyphoid, raises the suspicion that the continued fevers are very greatly confused and that there is a group of them which are not typhoid though so classed as a rule. It is exasperating to have these new points constantly arising when we think a question fairly well settled, but that has been the history of medicine. So now we must start in anew and find easy tests to distinguish

typhus, typhoid and paratyphoid to find out if there really are other specific fevers which have been classed under other names. The modern reduction of typhoid fever is so great that we are almost justified in asserting that modern sanitation has diminished other diseases formerly classed as typhoid.

**The attacks upon salvarsan** have become so frequent and strong in Germany that the Government contemplates restricting its use—an action which the civilized world would deplore. It is now known that the deaths due to it have led a few French syphilographers to abandon its use and forbid it in the clinics or hospitals under their control. Ehrlich is quoted as saying that of the million persons to whom it has been administered only 275 have been reported as dying from it, though he does not believe there are so many fatalities. Even if there were that many he thinks the advantages far outweigh the disadvantages. His opponents state that the drug is not a cure at all, but that the usual and safe remedies must be administered anyhow, so why run the risk even if it be slight? We had to reprove those who in the beginning permitted their enthusiasm to outrun their judgment and announce that one dose of salvarsan was a sure and safe cure, and now we would like to do a little to prevent the pendulum swinging too far the other way. There is no doubt that the fatalities have been more than 275 per 1,000,000, for every physician knows that many cases have not been reported. It is also known that in some nerve cases death is hastened. Still, there are urgent cases in which the patient would willingly run the risk and it would be dreadful if the government would deprive him of the

chance. The present controversy in Germany should have no other effect than make us more cautious. We must also explain to the patient that it is a dangerous drug in a small proportion of cases, and that he must decide whether to run the risk. Salvarsan seems to be a sure, prompt cure in yaws, and no bad results have been reported. It probably may be made safe in syphilis also and more effective, so let the profession have no restrictions placed upon them in this or Piorkowski's vaccine or any other new remedy. Already Swift and Ellis of the Rockefeller Institute make most encouraging reports in cerebral syphilis of their methods of the spinal injection of blood serum of the patient drawn an hour after the administration of salvarsan.

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**The need of more post-graduate study**

has been commented upon so often that it seems a waste of time to discuss it any further. Efficiency can not be acquired in the few years devoted to undergraduate study, but to refuse a license to a man until he has attained the highest possible skill is not practicable. The newly licensed young doctor must learn for himself in the special line of work he selects or into which fate thrusts him. Experience shows that he can do this infinitely better if he can spend a few weeks in his dull season every year or two at some nearby city, at the feet of those who have already attained skill in that direction. Our post-graduate schools seem to be drifting into this role of supplementing the undergraduate institutions, though they were organized to help busy general practitioners who had not kept abreast of the times through lack of time. Nevertheless we must utter a protest against the assumption of some of these teachers that the country doctor is neces-

sarily behind the times and is in duty bound to receive instruction from his city brother every little while. As a matter of fact the great medical advances are often if not generally made by country doctors, like Jenner, and the city men stand in the way of progress. The greatest living heart specialist, who has so well explained cardiac mechanisms, was a country doctor most of his life. Medical literature is now so voluminous and cheap, that the general practitioner in the city or country is made aware of new things almost instantly. It is amazing what splendid and advanced surgery is being practiced in little back woods towns, and what bad kinds we often see in the cities. We hope then to see the post-graduate schools catering more to the urgent demand for instruction which supplements the regular schools, and less to the *supposedly* backward doctors of the country.

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**Neurasthenia, and its bearing on the decay of northern peoples in India** was discussed at a meeting of the London Society of Tropical Medicine and Hygiene, Oct. 17, 1913, by Surgeon-General Sir R. Havelock Charles, G. C. V. O., Indian Medical Service (retired), Sergeant-Surgeon to H. M. King George V., and President of the Medical Board, India office. (*Transactions*, Nov., 1913). This is a very vital matter to the southern half of the United States, and to the northern half in summer. General Charles gives a wealth of data from his own experience in India which prove conclusively that the adverse factors of excessive heat, light and moisture and many others, for which the northern types of man have never evolved protective characters, cause a severe form of neurasthenia which in a few generations prevents pro-

creation. "An officer, otherwise in every way a good fellow, becomes short tempered; forgetful of names; troubled with sleeplessness; given to feel his work too much for him; disinclined to take responsibility; given to make molehills into mountains; procrastinating; susceptible on slight exertion, mental or physical to fatigue; and with a loss of all powers of concentration." It is called Punjab head, Bengal head, Burmese head or Philippinitis, and is a true picture of tropical neurasthenia which in time attacks everyone, though some withstand the injuries longer than others. It appears irrespective of the infections, though it is made worse by them, and Charles blames the lack of sufficient pigmentation as one of the physical defects which prevent permanent residence by northern types in very light countries. The lightest blonds have already largely disappeared from the old American stocks though a few still persist in a more or less enfeebled condition. Some of their illnesses are preventable, and it is high time for prevention to be placed on a scientific basis of observed facts. The recent death of a prominent blond physician in our south was due to this climatic lack of adjustment; pneumonia administering the final blow, and the sad part of it was his conviction that the whole matter of the law of adaptation was pure bosh. His neurasthenia had gone beyond the stage of "Burmah head," for it absolutely prevented logical reasoning and his professional opinions have done great harm.

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The dangers of wood alcohol are again being brought to public attention by the deaths of some people from drinking cheap Italian "claret" which has been adulterated with this poison. A very important study

of the matter has been made by Dr. Charles Baskerville, Professor of Chemistry in the College of the City of New York, and published as Appendix VI of the Second Report of the New York State Factory Investigating Commission. He stated that though probably only a small percentage of poisoning cases reaches the public ear, nearly a thousand instances were known since 1899, and that since 1906 they have been steadily increasing. Dr. Casey A. Wood of Chicago went over the subject thoroughly some years ago on account of the numerous cases of blindness coming to his notice. The situation was bad enough then, but seems to have been growing worse ever since, and is now so bad that it is not exaggeration to call it alarming. If three wedding guests can be killed and many seriously sickened just from drinking to the bride's health with "claret," it shows a really alarming state of popular ignorance as to the dangers of wood alcohol, "Columbian spirits" or "Colonial spirits." Here is where publicity may not do much good, as the culprits are not of the reading class. Baskerville suggests a law prohibiting the use of methyl alcohol in any remedy whether for internal or external use, and that the containers for that used in the arts be plainly marked poison, with the usual skull and cross-bones label. There also must be ample ventilation where it is handled, as in varnishing the inside of beer-vats for instance, since many fatalities result from inhaling the fumes.

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Our April issue will be devoted to the internal secretions. Papers have been secured from the foremost authorities of England and America and the whole number will represent the latest and most authoritative views on this all important topic.



## MEN AND THINGS

**Do Men Exhaust Their Originality at Sixty?**—Ehrlich and von Behring have reached that age, and from all over the world congratulations have poured in upon them.

The great demonstration seems tinged with a sad note as though these men had reached the end of their productive life. They will work on the old lines until they die and we hope the final end will be many many years off, but will the product be worth while? We hope it will be great, but can a brain or body of sixty, cut out new trails in the wilderness of ignorance? Osler showed how rarely it is done, and many thought that he said that men over sixty could not do anything at all. A great work may not be culminated until long after that age, but great discoveries are made

by mere boys. A few even believed that he said that men over sixty ought to be chloroformed, though he himself was nearly sixty at the time. Some of his critics were too old to understand what he said. The French have recently discovered that Osler was right and are rejuvenating their army as a means of preserving national existence. They have concluded that a captain must retire at 51, major at 54, a lieutenant colonel at 56, colonel at 58, brigadier general at 60, generals of division at 62, and gen-

erals of corps at 64, while members of the High Council of War may hang on a year longer. A similar scheme was proposed for our army some years ago but the *Journal of the Military Service Institution* refused to publish it. The editor was about 70. Press reports seem to indicate that the authorities are considerably worried as to what disposition to make of those officers over 60 who are really dead but whose friends hate to tell them. Why not retire them at 60? The few who are still mentally alert are not indispensable, and the rest can do an awful lot of harm. Grant said that in war no general should be over 50.



**The appointment of Dr. Thomas Darlington** as one of the commissioners to administer the new Workman's Compensation Law, is a particularly fitting one because of his past work and experiences. For one thing he has always made good, and that's the main thing after all. Yet his experience as a practitioner, head of the City's Health Department, and sanitary advisor to the iron and

steel industries, has given him a thorough knowledge of the conditions surrounding workmen. We are safe in predicting success for the new law in the hands of such administrators. More doctors of Darlington's calibre are needed in public affairs.

**The criminal conduct of anti-vivisectionists** is illustrated by the circular published in Philadelphia to the effect that Dr.

Crile's experiments on animals were made "in an endeavor to learn the extent of the agony that can be inflicted on a living animal." To make such a charge against one of the gentlest, sweetest and noblest of men, who has done so much to relieve human agony, is so atrocious as to call for the confinement of the human brutes who made it. When it is remembered that Crile's work was done to show that injuries of unconscious animals are the cause of shock, the charge appears still more criminal. The time has now come to take steps against people who are working against humanity. Some of them are known to be insane, but it is of such a kind and degree that deprivation of liberty is impracticable unless they commit some physical crime. But why do we not organize to confine them for such vicious charges? Are the laws of libel unable to protect us or do lawyers and courts put such absurd interpretations on what constitutes libel, that convictions are impossible? In either case we must call on our legal friends and legislators in the name of humanity to do something to end the present conditions so that we can prevent the flood of vicious and inhuman anti-vaccination literature. It should be made dangerous to publish what one knows is false or to make false charges even if one thinks them true, as some of the crazy antis doubtless think.

The economy of medical inspection of workmen is again illustrated by the report that it has caused a twenty-three per cent. diminution of days lost by sickness in the first six months of 1913 among the employees of the Brooklyn Rapid Transit Company. It seems that free medical care is given everyone asking leave of absence on account of illness. Consequently a large number of men who would hesitate about employing a physician until too late, are put on a self-sustaining basis soon and some prevented from becoming public burdens. Corporations as a rule, with some brilliant exceptions, have hitherto refused to care for sick employees because it was a needless expense. There were plenty of idle men to call on to take the place of the disabled, so "why worry." Such a selfish policy is bad business, as efficiency is not possible unless experienced men are kept. In addition, old employees identify themselves with the company and consider its welfare their own. It is now shown to pay well to cure the sick or keep them under observation to prevent sickness. Even unsanitary shops are bad business in the way of lessening the work power of employees. All this has been known so long and commented upon so often, that it was disheartening to see the knowledge neglected. It is different now that neglect may mean failure in the keen competition of modern industrialism where the profits are often from the saving of former wastes. The time has now arrived for every employer of labor to make some arrangement whereby his workmen can obtain competent advice in preventing and curing sickness and injury. It should be part of the wages and so stipulated in the contract, with reasonable limitations to prevent malingerer.

Illnesses not definitely caused by the labor should not be excluded from the benefits, as these are the very ones which cause the most loss of efficiency.

**Dr. Thomas Morgan Rotch**, Professor of Pediatrics in Harvard University, died March 9, 1914, in Boston. He was one of the foremost experts of the world in his specialty and had done a great deal to place the feeding of infants on a scientific basis by the proper modification of cow's milk. He might be considered one of the pioneers in this work. He was born in New Bedford in 1849, and graduated from Harvard in arts 1870 and medicine 1874. After some European study and hospital work, he soon became a teacher of diseases of children and never departed from his chosen field. His text-book on Pediatrics has long been a standard. He was a member of many scientific societies and an ex-president of the American Pediatric Society.

We are drifting towards universal medical supervision to prevent disability and without the intervention of law but as an economic necessity. The socialistic schemes of Lloyd George are not proving successful—indeed their main purpose apparently was to buy votes. England must have a

different system than Germany, and America must go at it in a way differing from both. Corporation physicians and surgeons may become our way of getting at this class, while our dispensaries seem to be drifting into that role for other classes. All this is far from the contract or lodge practice, which meets with so much disapproval, for it more resembles the public service medical practice as in the armed forces. Still, even lodge practice could be made much whiter than it is painted, and as it has apparently come to stay we might as well be resigned to the fate and mend what we cannot end. At any rate, there is a growing recognition of the necessity of constant medical supervision of some sort in place of the old plan of waiting until incurable. Industries adopting the system will outlast the others because of increased efficiency and this tends to make it universal because it pays the corporation primarily. The good to the individual and to mankind is secondary, more's the pity, though it ought to have been the primary consideration. Some American corporations are adopting the French system of contracting with insurance companies to insure all employees against accident, disease and death, half of the premiums being deducted from the wages. It is said that in France the law makes the employer responsible for accidents and deaths so that he pays for that much of the insurance as does the German employer, and those in New Jersey. Collective insurance is far cheaper than individual and is also more likely to result in medical supervision by both employer and insurance company. As this is a step in the improvement of public health, it must meet with the approval of all physicians.

**The psychic effect of compulsory insurance** is being studied in Germany and not a little concern is being expressed as to its effect in weakening the sturdy self-reliance and forethought which are so necessary for the health of a physique evolved for a bitter struggle for existence. Work and effort and strain of some sort are necessary for health and vigor, and when the spur and whip of necessity are removed, it is quite natural to drop into an idleness which causes decay, sickness and death. Only the exceptional man can con-

tinue work when there is no pecuniary necessity for it. Similarly too much paternalism in governmental supervision of any kind must teach the workman to lean on the state and not on himself. There must be a letdown in self-reliance when the workman feels that no matter what happens he and his family will not suffer for the actual necessities of existence. There is sure to be less alertness if he knows that a disabling accident does not stop his income. So there is a growing fear that Germany has gone too far, though some keen observers have stated that they can not find any signs of deterioration as yet in frugality, carefulness, forethought and self-reliance. Nevertheless, poverty which requires governmental or municipal aid is said to be growing at a disconcertingly rapid rate in Berlin and is assumed to be growing in the rest of the empire. Perhaps then it is just as well that we in America are going at the problems of universal insurance and medical supervision more slowly than in Europe. It is not all beer and skittles. The evils, seen or feared, in Germany, France and Great Britain may not appear if we take up the new conditions slowly enough to adjust ourselves to them. All such legislation is experimental and though the medical profession is strongly in favor of helping the worker to keep well, we must make haste slowly.

**Advertising by Medical Men.**—The newspapers have been so quick to draw false and hasty conclusions from certain portions of the discussion on professional advertising at one of the sessions of the midwinter Conference on Public Health, Legislation and Medical Education of the American Medical Association, held in Chicago, February 23 and 24—numerous news-items and editorial comments in the public press regarding one of the papers presented at the conference being particularly sensational—that we feel too great publicity cannot be given to the editorial in the *Jour. A. M. A.*, (Mar. 14, 1914) stating the real facts of the situation. As the editorial correctly states, the substance of the newspaper items was that the American Medical Association was considering the revision of its principles of ethics with a view to re-

moving or modifying the restrictions placed on individual physicians as to personal advertising. Some of the reports stated that revision of the principles of ethics would be taken up at once, and that an overwhelming majority of members of the Association were in favor of such a change. In complete disavowal of this the editorial asserts: "So far as we know there is no intention or indication of any change in the position of the American Medical Association on this question; the reports in the newspapers were due to a misapprehension of the character of the paper in question and the intent of the writer.

The paper was an argument for a better understanding and closer cooperation between the medical profession as an organization and the newspaper publishers as a class. The author did not advocate or discuss the question of personal advertising on the part of physicians; the proposition set forth and defended in the paper and presented to the conference was something entirely different from personal exploitation; it was a plea for closer cooperation between medical organizations and the press for the public good, and not for personal benefit. It suggested that the expert knowledge of the medical profession could be utilized by the public press in two ways: first, by the dissemination through the newspapers of scientific knowledge which would be of value to the public in preventing disease, and second, in placing at the disposal of those newspapers which desired it the expert knowledge of the medical profession in separating worthy and reputable from dishonest and disreputable institutions which might seek publicity through the newspapers.

Of these two important activities one has already been inaugurated by the American Medical Association, and the other is worthy of serious consideration. Neither of them, however, has the slightest bearing on the question of personal exploitation of physicians through newspaper advertising or by any other means. An honorable physician could not conscientiously advertise for personal business, for the same reason that the honorable minister and lawyer would not advertise. A professional man has no commodity to sell; his only assets are his scientific knowledge and his per-

sonal ability; and he who claims to possess greater knowledge or greater skill than his professional associates—whether physicians, preachers or lawyers—is an egotist, or worse, and forfeits the respect of both his professional brethren and his fellow citizens."

**It is true** we have honestly differed with some of the policies and methods of those in immediate charge of Association affairs, and have exercised the right that every Fellow ought to possess—the right to hold and express contrary opinions—but we have been so thoroughly in sympathy with the efforts to educate the laity in regard to hygiene, sanitation and public health generally—briefly, to dissipate popular medical fallacies and in their place provide the comprehensive information on medical topics every intelligent layman ought to have—that we welcome the opportunity of doing our part to show that the Association has been placed in a false light on this medical publicity question, and that the position actually taken is one no conservative, self respecting physician can rightly take the slightest exception to. It is futile for the ultra-radicals to cry that times and conditions have changed and therefore the physician must advertise like the vendor of commodities. Times and conditions have changed, thank God for that, but the relation of the honest practitioner of medicine to those who need his services has not changed—and humanity can thank God for that. As long as the doctor's value to his fellow men depends on the service he renders to those who depend on his knowledge, personal ability and skill, just so long will self respecting medical men refrain from advertising their personal attainments and qualifications.

The Association deserves the unreserved support of every earnest, public-spirited physician in its efforts to impress the lay press with the desirability of greater accuracy in publishing medical news. The suggestion that medical men should cooperate with the newspapers to secure such accuracy has everything to command it, and no intelligent person will interpret it as a recommendation to physicians to seek greater publicity for themselves. The position of the Association on this whole question of medical publicity is absolutely correct.



## STUDIES IN OBSTETRICS AND GYNECOLOGY.<sup>1</sup>

A Series of Contributions on Diseases of Women.

BY

ELLICE McDONALD, M. D.  
New York City.

### CHAPTER XVIII.

#### THE UNSOLVED PROBLEM.

The duty of a physician is three fold; first to cure the sick, second to teach others to cure the sick, and third to study disease and find remedies to cure the sick. Each of these is necessary to the complete physician, and without them, he fails in some part. To cure the sick is admirable, to teach, "delightful task to rear the tender thought," is laudable; but to discover the processes of disease and its cure, approaches the highest kind of duty.

To heal the sick is the function of the physician and aids those whom he touches; but pupils, taught to heal, go forth like the apostles to carry the word to others. One man's knowledge imparted to others is multiplied in proportion to the numbers he teaches and the power he has of imparting his experience. Those he teaches depend, however, more upon the character of the man and his influence over them as an uplifting stimulus which spurs them to greater efforts and keeps their ideals exalted. The spoken word is forgotten, but the memory

of the man remains. So, while it is important to teach medicine, it is more important to teach the methods of the study of medicine. A student's study does not cease, but should extend throughout his lifetime. Habits of accuracy of thought and methods of observation are the foundation upon which the physician may rear the superstructure of his life.

If he have not these, he will be spurious and not true coin, "a kind of semi-Solomon, half knowing everything from the cedar to the hyssop." And this alone is not sufficient; he must in addition be taught what has been known and where to find it. "Knowledge is of two kinds. We know a subject ourselves or we know where we can find information about it." No man can hope to achieve a working knowledge of medicine in four years; the span of life is all too short to grasp more than a moiety of it. The task is so great that we must waste no time on useless efforts and vain imaginings. "Naught but firmness gains the prize, naught but fullness makes us wise, buried deep, truth ever lies." We must demand that we be taught what has been done in the past and, of the past, what is truth and what is speculation. This lack of perspective in the study of medicine is a fault of teaching, often due to a desire of the teacher to appear an oracle and that all his words be taken as truth. The student magnifies authority and bows down before reputation. This is fatal to true perspective of the study of disease. When you

<sup>1</sup> Continued from December issue.

know a thing, to hold that you know it; and when you don't know a thing, to allow that you do not know it; that is knowledge. "Mark not who said this or that, but mark the words spoken," said Thomas à Kempis. "I open the truth," said Confucius, "to help only those who want to help themselves. My teaching is a solid square, but I present only one corner of the subject—I expert you to find the other corners." This must be the teacher's true attitude.

If the improvement of understanding is for two ends; first, for our own increase of knowledge, secondly, to enable us to deliver and make out that knowledge to others, how much better is it that we should investigate and study and discover for ourselves and impart our results to others.

This is the supreme function of the physician.

If we can reach a few by our work, a few more by our students, how many more can we reach by the printed line and typed page, read by all the world of earnest men who have that "natural feeling of mankind, a desire for knowledge. Every human being whose mind is not debauched will be willing to give all that he has to get knowledge." My profession, sworn idealists and practical altruists, is not worse than the average of mankind, and wishes for each addition to the sum of medical experience with a longing as that of Naaman for the healing waters of Pharfar and Abana, rivers of Damascus.

To alleviate human suffering and prevent human ills, must be our portion. To do this, it is not sufficient to rest content with our field as we find it, but we must experiment and cultivate anew. "I will not follow where the path may lead," said Strode, "but I will go where is no path and I will leave a trail."

The scientific study of medical problems is part of the work of every practitioner. Science is not confined within the four walls of the laboratory, nor such a rare bird that it is never caught by the clinician. The great present day problems are those of practical application and not those of pure science. Every man should feel that his profession requires of him something more than its practice as a means of his livelihood; he has a debt to pay, to add to the sum of its knowledge.

Clinical research is the greatest of all medical blessings. "It is twice blessed. It blesseth him that gives and him that takes." It gives to the worker an intimate and exact knowledge of his subject which can be obtained in no other way, and it benefits untold numbers whose physicians are readers and learners all over the world. Dif-fused knowledge immortalizes itself. It is a task which is never done as each piece of research opens to the scientific imagination more fields to work in and more problems to solve. The reward of duty is the power to fulfill another, and each clinical problem constitutes a pledge of duty to which every physician is bound to consecrate his every faculty to its fulfilment. By this, we may best fulfil the precept of the Great Physician, "Go ye to all the world, to every people \* \* \*."

In return, the research worker will gain in knowledge, in power, an unending interest and unfailing occupation. It does not require that vast and grand discoveries should be made. They seldom are except by men who have served their apprenticeship in the day of small things, and so had training in the discipline of study and accuracy of observation. If each adds his stone to the arch, what matters who lays the keystone. The plaudits may be his;

but he knows and the privates in the army of research know what contributions have gone before to make his victory possible. "Knowledge is the hill where few may climb; duty is the path where all may tread."

All physicians owe this duty—to contribute their quota, however small, to the sum of medical knowledge. It should, however, be approached in a true spirit of unselfishness, the spirit of disinterested curiosity which is the real flower of intellectual life. How else can he weigh and judge the facts and observe truly unless the motive of self-interest is put aside? Intellectual honesty is the true test to separate work that has distinction from work that has it not.

In gynecology and obstetrics, the problems which remain unsolved are many. The early gynecologists were the forerunners in abdominal surgery, and the names of McDowell, Emmett, Sims, James Simpson and Lawson Tait should be engraved upon the minds of all surgeons. However, surgery has now come into its own in research, and there remain for the student of diseases of women many problems which have to do with disordered function rather than the surgical correction of tumors, growths and obstetrical trauma. Among these subjects are sterility and its causes, the menstruation and menstrual disorders, the relation of the glands of internal secretion, particularly the ovary, to the health of women, and many other so-called medical subjects. One great problem is that of the hypoplastic woman with her many and varied evidences of abnormality. This *asthenia congenitalis*, congenital hypoplasia, or whatever name the symptom-complex may be given, is more or less a biological problem, inasmuch as it has to do with the relation of an abnormal

or aberrant type of woman as an animal to the normal or common.

In obstetrics, the field is still virgin. Bacteriology has had its miracles and surgery its victories, but obstetrics leads impotent and snail paced beggary. The four great complications in pregnancy, contracted pelvis, placenta previa, toxemia of pregnancy and eclampsia, and puerperal infection are still unsolved, and their treatment still disputed and obscure.

Of these problems, the greatest is puerperal infection. Puerperal infection is no less prevalent in private practice than it was before the days of antiseptic methods. In hospital practice, the mortality is very much reduced, yet there is record of hospital epidemics even in these latter years. To estimate the prevalence of this condition is difficult because in mortality statistics women dying from puerperal infection are frequently recorded under the disease of the organ which the infection attacks; for example, as peritonitis, from salpingitis, septic pneumonia, and other terminal expressions of infection. Puerperal infection is considered by the laity to be due to lack of care upon the part of the doctor, and for this reason, physicians dislike to register a possible criticism against themselves. So the mortality statistics in regard to death from puerperal infection are very inaccurate, and much under the actual rate of occurrence. Prof. Leopold, in 1907, stated that in Prussia 4,339 and in the German Empire 6,000 deaths occurred from puerperal infection in the previous year. Boche in an investigation extending over sixty years, and involving 363,624 deaths, stated that in Prussia 6,060 women died each year from puerperal infection, and that, in 1907, there were 6,000 deaths, show-

ing no decrease in the mortality. There has been no improvement in the maternal mortality, except in hospital clinics for the last twenty years. Cullingworth from a study of the Registrar-General's statistics for 1897 said that there had been no decrease between the years of 1843 and 1897; he said "Puerperal fever continues to prevail as though Pasteur and Lister had never lived. There is needed a strong voice to rouse us from our lethargy and to plead with desperate earnestness for the lives that are still being unnecessarily sacrificed."

In the mortality statistics of the U. S. census of 1910, 3,892 deaths from puerperal infection are recorded in the registration area, which comprises three-fifths of the total population of the United States. On this basis, there would have been from the whole population 5,485 deaths from puerperal infection registered each year from the whole of the United States. This number of deaths is probably much under-estimated on account of the difficulty of obtaining accurate registration on death certificates. It is unreasonable to suppose that with a much greater population, and in the care of physicians with less exact training that there should be a smaller mortality from puerperal infection than there is in Germany. It is probable that the mortality from puerperal infection throughout the United States is not less than 12,000 women annually. This is based on the census statistics, and upon the probable ratio of deaths from puerperal infection to the total number of births. In the City of New York for the year 1910 the total number of births was 129,080, and the deaths registered as caused by puerperal infection was 225, a mortality of .02 per cent. *This mortality is about eighteen times less than the mortality of an obstetrical hospital in*

*the same city and less than the best clinic report that could be found anywhere in the world.* So the registration is obviously very much under-estimated and hopelessly unreliable. It is probable, basing the estimate upon the reports of other cities and upon the proportion of puerperal infection to the total number of births in other places and in clinics that more than 700 women die annually in New York from puerperal infection. An example of the inaccuracy of the registration is that Berlin, a clean city with well trained physicians and exact registration returns, has a mortality rate per 100,000 population of 35.1 for puerperal infection. In New York, on the contrary, the mortality rate for 100,000 population is 7.8. This shows the inconsistencies of registration.

Thus it may be seen that puerperal infection in spite of the advances in technic has not yet disappeared, and is still worthy of study.

The total deaths from cancer for the year 1910 amounted to 41,000 and the average age at death was 59.2 years; amongst the cases of puerperal infection the average age at death was 27 years. Puerperal infection thus takes its dreadful toll amongst women in their early married life when the great part of their usefulness in the family and in the world is still before them. They die to leave small children and sorrowing husbands. The economic loss to the United States of such young and useful beings is in itself no small one. In cancer, on the other hand, death occurs amongst those who have exceeded the probable duration of life by twenty years, and who are getting toward the end of their usefulness in the world. The prolonged suffering and the fact that the person afflicted is usually of an age when the patient has children, a

position in the world, and a hold upon the affections of those around him, make cancer a disease for which it is easy to obtain research workers and money to support them. At the present time the public eye is occupied by the neo-alchemists with their philosopher's stone. The problem of puerperal infection is different. Here women die quickly, silently slip out of the world, and their memory is marked only upon the hearts of their young children and bereaved relatives. Yet a woman dead from puerperal infection is just as dead as one from cancer, but I have not yet seen any laboratory erected for the study of puerperal infection, or any money left as a foundation for its investigation.

The possibility of solving the problem of puerperal infection is infinitely greater than that of cancer. The causes of puerperal infection are known, and prevention is but a problem of the application of proper methods and a more thorough knowledge of the processes of the infection. Amongst obstetricians at the present time the most popular treatment of puerperal infection is a *laissez faire*, do-nothing policy. They claim that more women with puerperal infection get well if they are left alone than with any known method of treatment. This does not mean that their opinion is correct, but that most known methods of treatment are ineffectual or harmful. There is no more reason why the processes of infection through the uterus should go untreated than that infection elsewhere in the body should be left to itself.

The problem of puerperal infection is however, essentially one of prevention. The three avenues from which infection may occur consist, first, of the obstetrician and his instruments, second, of the vulva and

outward genitalia, and third, of the vagina. If all these can be made to harbor no infectious organisms, the probability of puerperal infection would be very slight.

The surgeon's hands and the instruments may be sterilized so that there is little danger of infection there. The vagina, as a rule, before labor, contains few, if any, pathogenic organisms, but the vulva and outward genitalia almost constantly harbor pathogenic organisms of varying degrees of virulence. In the puerperium, streptococci, as well as other bacteria may pass up from the vulva into the vagina, and on the third day of the puerperium the vaginal lochia of about half of all the cases of childbirth contains pathogenic organisms. It is obvious, therefore, that the elimination of puerperal infection must depend to a large extent upon antiseptic methods and preventive measures.

In the consideration of what antiseptic measures may be taken it is possible that return may be made to the antipartum douche. The vaginal secretions have always been said to have some bactericidal power because, if bacteria are inserted into the vagina, they usually cannot be recovered after some days. It is probable, however, that the bactericidal properties of the vaginal secretions are small or almost nil, and that the disappearance of the bacteria is due to the drainage and to the fact that, in the absence of trauma, bacteria will disappear from almost any epithelial surface. This is well shown by the introduction of bacterial cultures into the bladder, which cause no danger unless traumatic conditions are present.

Heretofore, experiments in regard to antipartum douches have usually been done with bichloride of mercury and formalin.

Formalin is a very weak bactericide having about one-third the strength of phenol, and is inert in the presence of albuminoid substances, such as mucous membrane and vaginal secretions. Bichloride of mercury is also rendered inert, inefficient and useless in the presence of organic matter, as soap, pus, mucous membrane and vaginal secretions. As a result, neither of these so-called germicides have any effect upon the vaginal flora, and only act as irritants to the mucous membrane. Bichloride of mercury, in addition, on account of poisonous action, is a dangerous germicide to use at labor when the huge raw surface of the uterus is capable of absorption, and numbers of deaths have been reported after its use. The ideal obstetrical germicide should be unirritating, not poisonous, and efficient as a germicide in the presence of organic matter.

Burckhardt and Kolb (*Zeit. f. Geburt. u. Gyn.* 1911-LXVIII-1) made a study of seven hundred women, half of whom received douches. Excluding all pathological labors, it was found that, amongst the douched patients, there was a morbidity of 6.5%, and, amongst the non-douched patients, there was a morbidity of 8.6%. They used a solution of chlor-m-kresol, one to four hundred, with a bactericidal power several times stronger than phenol, and possessing none of the destructive powers which bichloride of mercury exerts upon the epithelium. They conclude that the post-partum douche retarded bacterial growth for several days. The patient received no germicidal treatment after the first day. It is possible that, when the vulvar parts are washed each day with a similar non-irritating germicidal solution, that the organisms might be absent for a longer period. This study is of great interest from the

point of view of the preventive treatment for puerperal infection.

There are at present many other new germicides, which are efficient in the vagina and considerably more germicidal than chlor-meta-kresol. The investigation of this aspect of the problem in a large clinic would be of great interest.

It is important that no dangerously poisonous germicide should be used in the preventive or other treatment of puerperal infection.

The preparations of cresylic acid are popular obstetrical germicides. Witthaus (Wittaus and Becker, *Medical Jurisprudence*, 1911, Vol. 4, p. 1187) has collected 133 cases of poisoning from one of the most popular of these preparations, of which 11 cases followed irrigation of the uterus. Other cresylic acid preparations, including liquor cresolis compositus of the U. S. P. have similar dangers. The essential, after efficiency in an obstetrical germicide, should be its non-poisonous character as it must often be introduced into the vagina after labor or in the puerperium when there is great possibility of absorption from the large raw surface of the uterus. The development of an unirritating non-poisonous germicide, efficient in the presence of organic matter, would be of itself a great contribution to the prevention of puerperal infection.

The processes of infection in puerperal fever have not received intelligent study. By this is not meant that time and labor have not been expended, but that puerperal infection has been thought to be a disease apart and not to follow the ordinary course of infection as does lymphangitis of the arm, erysipelas or peritonitis. It is true that the infection is much modified by the softened and vascular pelvic organs under-

going as they do a sort of degeneration of involution. In addition, the large lymphatic and vascular supply of the pelvis with its adjacent large vessels and the lessened resistance of the pregnant woman do seriously alter the course of the infection. Still the processes of inflammation and infection are fundamentally alike and a great deal of our lack of knowledge is due to the fact that autopsies are not often obtained and, when obtained, the pathological findings are usually not properly studied. This is because pathologists are seldom familiar with conditions of pregnancy as they come but rarely in their routine autopsy work and, more's the pity, there are few pathologists-obstetricians.

The bacteriology in spite of the large amount of study which has been given it, is not yet settled. The role of the gonococcus in puerperal infection has not been determined. Stone, Mayer, Gurd and myself have shown with pitifully incomplete studies that a very large number of cases of puerperal fever are due to this organism. I have reported in this series a case of death with pure culture of gonococcus, and Gurd has reported a series of bacteriologically studied cases where the type of infection from the gonococcus was severe and the fever high. One case died. The lack of success of previous investigators in the cultivation of this organism has been due, as is well shown by Gurd (*Amer. Journ. Med. Sci.*, 1908, Dec. 9, and *Jour. Med. Research*, 1908, XVIII, 291) to improper media and to the fact that the cultures were taken by aspiration through a tube. This gave feeble or dead organisms and, when the culture was taken by swabbing the surface of the endometrium, discovery and growth of the organism was more frequent. The difficulty of cultivation of this organ-

ism is well known and Gurd has obtained good results with blood agar media of a titer of .5 phenolphthalein (hot titration).

Media for the cultivation of the gonococcus as well as for anaerobic and hemolytic organisms should be in the armamentarium of every investigator into the bacteriology of puerperal infection. It is possible that the gonococcus may be found to be one of the fertile causes of puerperal infection, and that the difficulty of cultivation and recognition will explain the fact that puerperal fever is still so prevalent in spite of our present methods. Gonococcus puerperal infection after recovery from the initial attack remains as a chronic pelvic inflammation, in this way differing from most other infecting organisms. The late crippling effect of gonococcus puerperal infection renders it a more serious condition than is commonly recognized and make its prevention a necessity.

The knowledge of the prognosis of puerperal infection is almost unknown. All we know is that puerperal infection is a self-limited disease, like erysipelas, and tends to a spontaneous cure. The influence of exhaustion has been shown by Williams (*Bos. Med. Surg. Jour.*, Sept. 22, 1910) and Wirz (*Hegars Beitrage z. Geb. u. Gyn.*, 1909) to be a great factor. Puerperal morbidity, with the exception of mastitis, is increased in direct proportion to the duration of labor and the morbidity after low forceps was less than that after spontaneous labor, presumably because labor was shortened and exhaustion lessened.

A persistently high pulse rate, even with relatively slight fever, is serious ground for alarm especially when the temperature subsides as the pulse rate increases. Jaschke (*Zeit. f. Geb. u. Gyn.*, 1910, LXVI, 2) states that the paralysis of the splanchnic vessels

is the index of the severity of the disease, while it is the main source of danger. The blood pressure and the second aortic sound show the condition of the vessels and the possible compensatory power of the heart. In cases where the blood pressure does not decline or the decline is followed by return to normal, the prognosis is good. A discordance between the pulse rate and temperature is a serious indication.

Delirium is a rare symptom and one of utmost gravity. Instead of being anxious and disturbed, the patient may present an exaggerated feeling of well-being and express a desire to undertake her usual occupations. In 56 cases with delirium, 39 ended fatally. Its occurrence between the third and eighth day of such illness is a prognostic symptom of the utmost gravity. The prognosis as well as all other parts of the problem offer a great field for investigation.

The serum or vaccine treatment of puerperal infection offers but little hope of cure. It is to be remembered, in streptococcus infection, the small amount of toxin developed and the absence of bactericidal properties in the blood makes it probable that the relief from this form of infection comes through leukocytosis and not through the formation of antibodies. In animals treated with streptococci, phagocytosis is an important factor in the production of immunity and the serum exhibits neither bactericidal activity with respect to micro-organisms nor antitoxic effect with respect to the action of filtrates of cultures.

From the evidence, both clinical and experimental, it may be concluded that anti-streptococcus sera and vaccines as at present prepared have but slight protective and curative value. It is to be remembered that puerperal infection is a self-limited dis-

ease which tends to a spontaneous cure, like erysipelas, and the limitation of the infection is often ascribed to the serum or vaccine when it would have occurred in any case. Erdman (*J. A. M. A.*, 1913, Dec. 6) has shown in the analysis of 800 cases of erysipelas that this form of streptococcus infection was not benefitted, but the recovery delayed and the morbidity increased by sera, vaccines and filtrates of cultures.

The use of vaccines in puerperal fever has little or no scientific foundation. In the words of Theobald Smith (*J. A. M. A.*, 1913, May 24) "The medical profession should see to it that vaccine therapy does not degenerate into inconsiderate and reckless experiments upon human beings, that it does not create false hopes in hosts of patients and that it does not originate and end in commercialism and the desire to exploit the weak and unfortunate."

Streptococcus infection, however, only causes rather more than half of the cases of puerperal infection and its study should include that of other organisms. The staphylococcus is a frequently found organism and, contrary to the usual belief, is responsible for many cases of puerperal endocarditis. Infection with this organism is not less severe in type than that from the streptococcus, as is shown by Basso (*Ginecologia*, Ap. 30, 1908), who collected a large number of cases with a mortality of 80 per cent. In fact, one of the striking phenomena of puerperal infection is the increase in severity which organisms of comparatively small virulence, such as the gonococcus and colon, may acquire and the severe systemic symptoms and danger to life they may cause. This may be due in part to the lessening of resistance to infection which occurs in the pregnant.

The whole tendency of research in the treatment of infection is toward chemotherapy as Ehrlich said in his address before the British Medical Association. The question of treatment in puerperal infection is unsettled and will remain so until the ideal obstetrical germicide is discovered. Those heretofore used, such as bichloride of mercury and formalin, are inefficient because they are neutralized by the albuminoids of the body tissues or discharges: others, such as phenol and the cresylic acid preparations, are too poisonous for free use. The idea that a germicide must be toxic if it is effective against micro-organisms is a mistaken one; otherwise chemical substances would be effective in proportion to their toxicity, which is not so. Nor does it explain the fact that the same substance, cresol, for instance, may be three times more germicidal in emulsion than in solution, although the toxicity may be the same. The ideal obstetrical germicide, non-toxic, efficient in the presence of albuminoids and unirritating, is not too much to hope for and when it is discovered, it will aid very decidedly in the prevention and cure of puerperal infection.

The use of intra-uterine douches, for example, would be put upon a new basis if such a germicide were available to replace such irritating substances as bichloride of mercury, formalin and the cresylic acid preparations. *Primo non nocere* is the good old fashioned rule of a wise and skeptical profession and, with this condition fulfilled, it might be possible to do many things in puerperal infection which at present are forbidden.

But the work of investigation should be taken up by the larger clinics. The establishment of research foundations for the study of puerperal infection would produce

more immediate results and greater benefits to humanity than all the cancer research that has been done. In spite of the vast amount of work that has been done on cancer, the hope of a cure is no nearer, and, except for the fact that it has been proved possible to immunize mice to transmissible mouse cancer, the research has made but little progress. Had a tithe of the effort been applied to puerperal infection, it is probable that this plague would be conquered and the wail of the motherless children would be banished from the land. I would that these little voices in lamentation might ring in the ears of every obstetrician and pathologist until each is driven to contribute all his energies and all his efforts to the salvation of the thousands of mothers needlessly sacrificed.

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## MOTOR INSUFFICIENCY OF THE STOMACH.

BY

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Modern investigation has shown that normal gastric motility is capable of subdivision into three component parts, the correlation of which constitutes the normal motor functions of the stomach. These are:

1. The *peristole*, by which is understood a concentric drawing together of the stomach so that it adapts itself to its food contents.
2. *Peristalsis*, or a series of vermicular or wave-like muscular motions running in the direction of the longitudinal axis from left to right, which action propels food from the fundus toward the pylorus.
3. An alternate contraction and relaxation of the pyloric sphincter regulating the

output of food, the pylorus remaining tonically closed against the pressure of food until a certain degree of acid gastric juice has been secreted, when the sphincter relaxes and permits a portion of the acid chyme to escape into the duodenum, when it again closes until this escaped portion of food has been neutralized.

A motor insufficiency occurs when there is a loss of equilibrium between the requisite labor and the power of labor.

When the motor power of the stomach is not sufficient to meet the demands made upon it, the viscus will discharge its contents only partially, or it will become empty only after a prolonged period of time.

There are two fundamental causes for motor insufficiency.

The *first* consists in a deficient muscular tone of the gastric muscularis, by which there is either a failure in its peristole or peristalsis, or both. This is known as atony.

The *second* consists in a mechanical interference with the expulsion of its contents.

Each of these two conditions represents a distinct clinical entity, although they frequently are confused; the first, or atony, being purely of a functional nature, while the second, or mechanical motor insufficiency, is the expression of a definite organic lesion of the gastrointestinal tract.

The first condition, or atony, is common. It may be hereditary; it frequently is encountered after infectious disorders, anemia and cachectic conditions. It is present in neurasthenia and psychasthenia and consists in a failure of the peristolic, or peristalsis, force of the stomach.

The simplest form is the insufficient peristolic tone. This tonus is essentially the

function of the fundus and the central portion of the stomach.

Such stomachs, while giving rise to symptoms suggestive of atony, show no delay in their capacity to expel their food contents within normal limits of time. This condition can be well demonstrated fluoroscopically by observing how the stomach fills.

In the normal stomach, after the introduction of 30-40 c. c. of bismuth mixture it is seen that the bismuth does not pass at once to the most dependent portion, but that it forms a narrow column in the upper one-third of the stomach. On the addition of more food, the diameter of this column increases until the stomach is filled, the upper level remaining constant, and with but slight depression of the greater curvature. This is due to the normal tonicity of the stomach wall which by its concentric pressure maintains its contents in tubular form.

On the other hand, in the atonic stomach we see the reverse picture. The normal tonus being deficient or absent, food passes at once to the most dependent portion of the organ, such stomachs filling like "a vase, from the bottom up."

This motor function of the stomach is very important in the digestive process, for the motor and secretory powers of the stomach are, in a measure, directly related.

Normally acid chyme passing through the pylorus excites, through hormones, the secretion of the intestinal and pancreatic juices. It also excites a nervous reflex which closes the pylorus after a certain amount of acid chyme has passed into the intestine. With lessened acidity of the stomach contents or with anacidity, it is found that the stomach empties itself much more rapidly than if the chyme were acid.

On the other hand, with hyperacid conditions, the food may be retained too long, because but a small amount of very acid chyme will be tolerated in the duodenum, and the duodenal reflex keeps the pylorus in a state of spasm.

The first of these conditions is well illustrated in functional achylia, in which cases the stomach empties itself so rapidly that the intestinal digestion is inadequate to care for the food and a diarrhea is often the result.

The symptoms of motor insufficiency, or atony, depend upon the degree of insufficiency. The characteristic symptoms are a feeling of weight or oppression in the epigastrum, following the ingestion of food. The patient complains of feeling overloaded when but little food has been taken. There is a desire to eructate gas, which generally affords temporary relief; vomiting is infrequent.

Physical examination is as a rule unsatisfactory. Well nourished individuals, with a broad costal angle, presenting no evidence of Stiller's sign of degeneration, are rarely subject to functional stomach disorders, and if so, they are of a very transitory nature.

On the other hand, those who present the stigmata of the enteroptotic habitus, characterized by the acute costal angle, are very prone to functional disturbances of motility, and it is among this class of patients that we most frequently see the pure type of atonic stomach.

The ptosed stomach is not necessarily an atonic stomach, although atony is a frequent complication of gastrophtosis.

Examination of the fasting stomach in the simpler forms—those cases where the peristolic function is alone impaired—fails to show little if any impairment of its pro-

pulsive power; such stomachs emptying within normal limits, viz.: 6-7 hours after an ordinary meal.

In the more marked types of atony, where there is an insufficient peristaltic action, examination of the stomach 6-7 hours after a mixed meal will demonstrate the presence of food remnants in varying degrees. But in such cases, although the food current may be retarded, yet it is certain, the stomach invariably being empty in the morning after a mixed meal taken on the previous evening, and an exploration of the fasting stomach anywhere from 7-8 hours after food, shows it to be invariably empty.

The test breakfast, in atony presents no characteristic picture. In some instances the total quantity is in larger amounts than that found in the test breakfast of non-atomic stomach, but this is not a constant rule, as it is not always possible to aspirate food contents from an atomic stomach.

The older tests for gastric motility, such as the absorption time of salol, etc., have now been abandoned. The only accurate test for atony being by means of the fluoroscope or the X-ray.

A mechanical motor insufficiency is, as has been said, the result of some lesion whereby the pyloric sphincter is prevented from dilating to its full extent and allowing a free exit of food from the stomach. This mechanical interference may be intermittent, as seen in pylorospasm from a chronic appendix or ulcer, or permanent, as the result of inflammatory thickening of the pyloric wall, cicatricial contraction, or adhesions, and tumor growth both benign and malignant.

In their earliest conception these cases present a condition of hypermotility with hypertrophy of the gastric muscularis. After prolonged strain, this compensatory

power begins to fail and as a result we find varying degrees of retardation in the food current. Thus a mechanical motor insufficiency is the expression of a certain degree of stenosis at or around the outlet of the stomach and is in a measure proportionate to the amount of resistance encountered and the degree of compensatory hypertrophy.

Such a motor insufficiency having a fundamentally different etiology to that of the atonic type, its true recognition is of paramount importance, both as regards prognosis and treatment.

Patients presenting evidence of a mechanical motor insufficiency may give a clear cut previous history of the condition which caused the insufficiency, thus we may obtain a well defined anamnesis of duodenal or pyloric ulcer, or cholecystitis with resulting adhesions; or again, the previous symptoms may be so marked or atypical as to render the true recognition of the underlying cause impossible.

The symptomatology then of a mechanical motor insufficiency is that of the primary pathological condition, plus the symptoms due to the varying degrees of pyloric stenosis or interference with the pyloric function. These are pain or distress from

1. Increased peristalsis and hypersecretion.
2. Symptoms of food stagnation.
3. Inanition from the inability of sufficient chyme to pass from the stomach into the small intestine.

Pain, varying from a moderate degree of discomfort to actual cramps in the epigastrium, is experienced, especially in the earlier stages, when muscular compensation is well established, and is due to the increased peristalsis.

This pain at first is more apt to come about 2-3 hours after eating when the digestive processes are at their height, and while the stomach is trying to force its food contents through the impeded outlet. Sometimes it is relieved by soda, and food may afford some temporary relief, but later it is again followed by increased distress. It is further accentuated, from time to time, by a spasm of the pyloric sphincter.

In the mild cases actual pain may be absent, the patient simply complaining of a sense of fullness in the epigastrium, occurring usually also 2-3 hours after meals. Bicarbonate of soda and the raising of gas may afford temporary relief.

In advanced cases, where the stomach never entirely succeeds in emptying itself, pain may occur at any time. Later, with gradual failing muscular compensation, and the increasing degree of food retention, the pain or distress becomes more or less continuous, unless relieved by lavage or vomiting.

The symptoms of hypersecretion are in many respects similar to those of the increased peristalsis, viz.: discomfort or pain in epigastrium, except it is apt to be accompanied with more gaseous distention.

*Food Retention.*—The inability of the stomach to expel its food contents completely after each meal, ultimately results in an accumulation of stagnating food remains, producing loss of appetite or an appetite that is easily satisfied. This is especially so in stenosis due to malignancy.

With the continued accumulation of food, vomiting sooner or later appears. This vomiting may first be induced by the patient to relieve his feeling of distress, but as a rule, those with any marked degree of pyloric obstruction vomit easily.

The vomiting as a rule occurs several hours after meals, or more generally in the early morning, when the patient will vomit copious amounts of watery fluid containing particles of food eaten on the previous evening or during the day; such patients will not infrequently comment on the fact that they have recognized certain food remains that they had taken 18-24 hours previously.

There are certain cases of stenosis where vomiting does not occur, the stomach being ultimately able to force its food through the pylorus. According to the inability of the chyme to pass into the small intestine, symptoms of malnutrition develop.

These are evinced by loss of weight, dryness of the skin and tissues, and the appearance of acetone in the urine. The bowels become constipated and the urine is lessened in amount in proportion to the lack of intestinal absorption. Gastric tetany is a rare complication.

The course of the disease is, as a rule, steadily progressive, especially in malignant cases. There are periods of exacerbation due to pylorospasms, and increased swelling around the inflammatory areas as in ulcers. Again there are periods where a degree of motor compensation is reestablished, and the patient has relatively little distress.

*The Physical Examination* may show nothing, even in well advanced cases where food remains are found in the fasting stomach.

Inspection may show the outline of a peristaltic wave; this can often be elicited by tapping with the fingers over the stomach.

Lockwood states that "the most vigorous peristalsis is seen in benign stenosis; that the cancer waves are usually feeble or invisible

unless engrafted on an old ulcer." He regards this relative vigor of the peristaltic wave as an important means of differentiating between a benign and malignant form of stenosis. The presence of secussion sounds has relatively little diagnostic significance. If they can be elicited at a time when the stomach should normally be empty, they may denote the presence of a fasting hypersecretion.

The examination of the fasting stomach is of paramount importance in the diagnosis of a mechanical motor insufficiency due to an obstructive pyloric lesion.

After a mixed meal taken between 10-11 o'clock in the evening, if the stomach be aspirated 9-10 hours later, it will be found either empty—save possibly for 5-10 c. c. of swallowed saliva, or it may show the presence of fasting hypersecretion, with or without any evidence of food remains.

By fasting hypersecretion is meant any quantity of acid gastric juice over and above 30 c. c.

I believe that the presence of a fasting hypersecretion is among one of the earliest evidences of a disturbance in motility due to some organic lesion of the gastrointestinal tract, and if found to be constantly present, is of great diagnostic importance, and at once differentiates the case from that of a simple atony.

Fenwick says that 88% of all cases of chronic hypersecretion were accompanied by a demonstrable lesion of the digestive organs, and adds, that in the remaining 12% no disease which appeared to have any connection with the stomach could be found. Later his attention was called by W. Mayo to the fact that he had often discovered latent disease of the appendix in persons who seemed to require a gastrojejunostomy and that the removal of the

appendix was followed by subsidence of the gastric symptoms.

In 53 personal cases of the fasting hypersecretion, 29 showed at operation a demonstrable lesion of gastrointestinal tract, the amount of hypersecretion varying from 30-90 c. c.

On the other hand, in reviewing 261 cases of simple motor insufficiency, or atony, in which over 60% were complicated by some degree of ptosis, no hypersecretion was found; the fasting stomach being invariably empty, or containing a few c. c. of swallowed saliva.

Where food remains are found, either gross or microscopic, 11-12 hours after ingestion, it is pathognomonic of a stenosis; this is especially so if it can be demonstrated on two or three separate occasions.

Evidence of food stagnation may alternate with a pure fasting hypersecretion. This is illustrated by the following case:

Mrs. S. H. S. Aged 53. The patient had always been in good health, never having had any gastrointestinal symptoms until the winter of 1912, when she began to have a burning pain in the back just below the angle of the right scapular. This persisted with great constancy, especially during the day when she was on her feet. It was relieved by lying down. This continued for almost nine months, when she began to complain of a feeling which she described as "stiffness" in the epigastrium on awakening. She would raise gas and obtain some relief. There was no vomiting, but occasional attacks of nausea, which passed away after breakfast.

The bowels, which had always been regular, began alternating between diarrhea and constipation. There was no history of melena or jaundice.

The physical examination was negative, save for a dorsal point situated 1 inch below the angle of the scapular on right side, and  $2\frac{1}{2}$  inches to right of the spinal column.

Examination of the fasting stomach 14 hours after a roast beef sandwich and a glass of water gave a return of 60 c. c., 25

c. c. of which consisted of food residue. The following day the fasting stomach contained 90 c. c. clear watery fluid; no food remains, gross or microscopic. T. A. 80. Free HCl 42.

On the two subsequent days amounts of clear watery fluid, with a high acid index, were obtained, varying in amount from 40-85 c. c. On the fifth morning 125 c. c. of fluid was extracted which, on settling, showed 50 c. c. of old food remains.

The patient was operated on by Dr. Dowd, who found a fairly marked degree of inflammatory thickening around the pylorus, due to an ulcer situated just outside the sphincter.

*The Test Breakfast* has not the same diagnostic value as that afforded by the fasting stomach. Its chief characteristic is the large amount of the return and the frequent evidences of an alimentary hypersecretion.

An average test breakfast, extracted one hour after an ordinary baker's roll and a glass of water, will yield between 40-60 c. c. of returns. When an obstructive pyloric lesion exists this amount will not infrequently amount to 150-300 c. c. On standing for a short time in a graduated jar, the solids will settle, leaving a supernatant fluid layer, which may constitute from a half to two-thirds of the total test breakfast.

In the benign cases the acidity is always high, varying from 70 to 120 points, with a high relative amount of free hydrochloric acid. Lactic acid is rarely found. Sarcinae are frequently present.

If the test breakfast is examined carefully, evidence of old food remains may be detected, which failed to be extracted in examination of the fasting stomach. Slight traces of bright blood are so frequently encountered in taking test breakfasts that I do not feel this of much diagnostic importance. In malignant cases, there may be a general admixture of semidigested blood,

giving the whole test breakfast a dark brown color.

In cases of malignancy lactic acid is very frequently present, together with Boos-Oppler bacilli. Their absence, however, does not exclude cancer.

The total acidity in the early stages, may equal those of the benign series, but there is a rapid tendency toward a lowering of the acid index.

It is outside the scope of this paper to discuss the radiographic diagnosis of a mechanical motor insufficiency due to a pyloric obstruction or stenosis, further than to say that it is of great value, especially in the early cases. The principal characteristic is undue retention of bismuth six hours after the bismuth meal, this being far in excess to that seen in simple atony; together with the bowl shaped appearance of the stomach, the greater curvature sagging downward and to the right, while the last portion of the greater curvature, instead of curving upward and to the right, will be drawn perpendicularly upward and to the left, giving that portion of the stomach an "undershot" appearance, sometimes spoken of as the "bull dog's" jaw.

It has not been my intention to discuss, save in a general way, the diagnosis of the underlying pathological condition responsible for the different degrees of pyloric obstruction. As has already been stated, this may be the result of several different conditions, both benign and malignant, involving the stomach and duodenum.

It is not only essential to recognize the pyloric stenosis, but to determine, as far as possible, the causative factor, and to this end the examination should be exhaustive, including not only the history, physical and gastric examination, but also the examination of the urine and feces.

The fecal analysis should not alone consist in the examination for occult blood, but embrace the presence of sterobilin, the amount of total saponified and unsaponified fats, the results of the casein digestion, fermentation test in Schmidt's tubes, and microscopically the presence of undigested muscle fibre and triple phosphates.

As Herschell (*Interstate Med. Jour.*, March, 1912) points out, in a very early stage of duodenal ulcer there are in many cases distinct evidences of an irritation of the pancreas; that such a pancreatitis unaccompanied with jaundice is due to an extension of a duodenal catarrh along the pancreatic ducts, and implies a source of irritation in the duodenum. He believes in cases presenting the characteristic pains of ulcer, coming at a definite period after meals, that the recognition of a mild degree of pancreatitis would be of material aid in making a differential diagnosis between a functional hyperchlorhydria and that due to a chronic appendix or duodenal ulcer. Moreover, it must be borne in mind that in certain instances latent disease of the appendix and the gall-bladder can produce gastric motor symptoms, with a history that closely simulates that of duodenal ulcer. Any of these conditions can give rise to pylorospasm, with evidence of undue food retention and a fasting hypersecretion.

In 38 personal cases of chronic appendix disease, in 20 cases a fasting hypersecretion was found, the quantity varying from 30 c. c. to 70 c. c. Amounts of gastric juice under 30 c. c. were not included.

I have tried to sketch briefly the two fundamental types of motor insufficiency.

The first functional in nature and dependent on a deficient tone of the gastric muscularis, and frequently accompanied by Stiller's signs of degeneration, viz.: the

acute costal angle and the detached 10th rib. The second is dependent on a definite lesion of the gastrointestinal tract whereby the free passage of food is prevented through the pyloric sphincter, resulting in a varying degree of food retardation and the frequent presence of a fasting hypersecretion.

As has been said, these two conditions have a distinctly different etiology and it is only by a realization of their significance that we can hope to arrive at the correct diagnosis.

## THE MASKED PIETY OF THE NEUROTIC.<sup>1</sup>

BY

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Translated, abridged and annotated by  
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Stekel has repeatedly emphasized the fact that *all neurotics are religious and are ashamed of their piety*. There is no theme of much greater significance for the understanding of the neuroses than this one. Neurotics take the same "bipolar" attitude towards God that they do to all the other facts of life. (By this Stekel means that *all psychic phenomena are bipolar*, i. e., that two antagonistic tendencies are striving for the mastery of the soul. Masculine strivings correspond to feminine ones, masochism to sadism, exhibitionism to voyeurism, pride to humility, love to hate, good to evil, etc. It follows therefrom that some feature of a dream or a symptom in a psycho-neurosis need only be translated into its

opposite to discover its meaning.—T.). Their defiance of and resistance to authority result in an attitude of hostility towards the trias father-teacher-God; but *they all indulge in secret religious services* the true nature of which is extremely cleverly disguised and which is intermingled with all sorts of penitential procedures. This *religious compromise*, like all other compromises of the neurotic, results from the effort to unite the several desires into one and to do justice to all of the individual's conflicting desires. Classical forms of these religious compromises are seen especially in the obsession neuroses (incorrectly termed "compulsion neuroses"—T.);—submission and resistance to God are fused into one symptom.

It is remarkable how many *freethinkers and atheists* one finds among neurotics. But this atheism is not genuine and will not bear the test of careful examination. They all show a highly emotional attitude towards the problem of religion. Many of them are members of associations of freethinkers, are monists, or have written essays to disprove the existence of God; many of them indulge in mockery of God and religion and make merry over the priesthood, or are fanatic priest-haters. This emotional attitude is sufficient to show that there is something suspicious about their atheism. A real atheist will not make merry over the idea of God and will not indulge in sarcasm. For it is manifestly absurd to assail what does not exist. As Gottfried Keller has very aptly said: a passionate lover of God and a passionate sceptic are really yoked to the same wagon, from which the one cannot escape any more than the other. No better illustration of this can be found than the philosopher Nietzsche, a minister's son, who worshipped in secret all his life and whose book

<sup>1</sup> The original of this paper appeared in the *Zentralblat für Psychoanalyse*, Sept. 1912, under the title "*Masken der Religiosität*."—T.

"Thus Spake Zarathustra" was intended to undermine the Bible and to take the place of a new Bible—thus fulfilling his great historic mission. (In 1912 Stekel announced his discovery that as a complement to the feeling of inferiority from which neurotics suffer they also suffer from a secret delusion of greatness which he calls "*the great historic mission*,"—another illustration of the law of bipolarity.—T.) In Nietzsche's case too the emotional attitude to the problem of belief is very striking. It is safe to say that anyone who writes as an Antichrist is at bottom a pious Christian.

In the life history of every neurotic it is possible to demonstrate a period of varying degrees of piety. Without a thorough knowledge of this pious period it is impossible to understand his personality or his neurosis. But these patients are very averse to speaking of these matters and can be induced to do so only with great difficulty. They will gladly tell us all about their sexual experiences, their misdeeds and their disagreeable experiences, but they will cleverly conceal their religious experiences, as if to speak of them would rob these emotions and experiences of some of their value. They are all ashamed of their secret piety, and analysis shows that their infantile attitude has not been overcome and powerfully influences the neurotic symptoms. From this pious period certain fragments have been preserved and testify to the "vanished glory." So one neurotic tells us that he treasures a crucifix that was presented to him by his grandmother and that hangs above his bed and accompanies him on every journey; another cherishes a prayer-book that was given him in his childhood and he would not part with it under any circumstances; a third carefully preserves a picture of a sacred subject in his note-book

that accompanies him wherever he goes; and so forth. *All neurastics are relic worshippers in secret.* The physician has only to discover what particular object the respective patients value as religious relics. At the same time he will discover the belief in the great historic mission which manifests itself, in men, as the identification with Christ, Satan, Judas (or Moses—T.), and in women as the identification with the Virgin Mary.

These relics need not necessarily be of a material nature; they may be only the fragments,—a single word or a combination of words or syllables,—of a childhood prayer; the preserved shred serves to take the place of the whole prayer. *Pars pro toto!* The following extracts from the analyses of several patients furnish striking illustrations of masked piety.

A woman suffering from an obsession neurosis invariably on retiring says, "givme," or "gme," or "gently," and only then can she fall asleep. What is the significance of these nonsense words or syllables? The first is a remnant of the following prayer that she used to recite at "Dear God, forgive me! I have done no wrong, mother has done no wrong, nobody has done wrong. Dear God, forgive me!" Of this prayer she has preserved only parts of the words "forgive me" in the distorted way characteristic of the speech of young children. "Gently" is a fragment of a song from Weber which may be roughly rendered: "Gently, gently, piously, soar into the starry sky. Ring out my song, go forth my praises and my prayers,—ascend to heaven." To her this song is equivalent to a prayer. Instead of uttering the above words she may imagine she hears someone whistling or singing the melody, "Gently, gently," which is obviously only a masked prayer,

or, perhaps more correctly, a religious mood or feeling.

Most frequently these rudimentary prayers are fragments from the Lord's Prayer. So the aforementioned "givme" is the echo of "Forgive us our trespasses, as we forgive those who trespass against us." A gently whispered "Amen" before falling asleep may replace the whole prayer. These words are spoken when the person is in a sort of half sleeping state; it is as though the intellect were ashamed to pray and it required the incipient narcosis of sleep to overcome this shame. "Deliver us" is the prayer that another neurotic brings himself to utter when he is in this hypnagogic state. (By the *hypnagogic state* is meant the condition of half sleep which immediately precedes sleep; when the person has stopped to think and is just falling asleep.—T.) Fragments of childhood prayers, and now and then the whole prayer, often act as hypnotics by virtue of their influence in calming an apprehensive soul preoccupied with the problem of salvation. Not infrequently one hears highly intelligent men confess that they regularly repeat the prayer they learned in their infancy. One of these, a professor of philosophy in a certain university, who had written a profound atheistical treatise, gave the following rationalizing explanation for this practice; the prayer takes him back to the days of his childhood and begets in him a childish frame of mind in which he ceases to think and then he falls into a wondrously peaceful sleep. In reality this is a compromise formation. He becomes infantile, the infantile piety is awakened and re-creates that clear conscience which permits sleep. (There is no doubt that other determinants too co-operate to produce this sleep.—T.).

Many neurotics rehearse prayers composed by themselves, the themes of which are usually the welfare of those about them and which are the reactions of the troubled conscience against the animosity and vindictiveness in their souls. (What heart is free from the desire for the death of our enemies and even of those loving ones whose motives we do not understand? What child has not again and again wished for the death of those who love him most?—T.). So one little girl prayed: "Dear God, watch over my parents, my sisters, my friends," and then followed a list of acquaintances whom she also wished to be saved. Toward a number of these she cherished hostile thoughts, but her conscience transformed these into prayers. In her maturity she retained only a poor relic of this prayer, the gently whispered and faltering "watch over" or "watcho." But she dare not give up this prayer for fear that if she did so something would happen to her loved ones. Here we have an illustration in a negative form of the (neurotic's) belief in the omnipotence of his thoughts. Alfred Adler has called this the phenomenon of "*Godlikeness*." (Neurotics, like primitive races, entertain a belief in the *omnipotency of thought* and in the magic power of words. A commonplace illustration of this belief is offered by the popular saying: "Speak of the devil and he is sure to appear." The idea, strange to say, is retained in the so-called "ideomotor theory" of some modern yard-stick psychologists.—T.) Many obsessive ceremonials practiced by neurotics before retiring for the night are really equivalents of a prayer. In fact Stekel regards all *obsessive phenomena* as *masked prayers*. As such are to be regarded various ablutions before going to bed, mysterious bowings, rubbing of the palms, throwing oneself on the ground, etc.,

etc., all of which may be shown to be *rudiments of infantile religious beliefs*. Many neurotics can be surprised in the act of folding their hands as if in prayer, or in a causeless kneeling and lying flat on the ground. It is to be noted that *these procedures are carried out in a kind of waking dream*. The splitting of consciousness has gone so far that many of the patients have no inkling of the religious nature of these ceremonies or, more correctly, do not want to have any inkling of it. In such a "twilight state" whole prayers may be repeated, especially at such times when the subject feels his individuality threatened.

Other masks for piety may be employed to express the religious craving and the simultaneous desire to conceal one's pious inclinations from consciousness. Of this kind are the *visits paid to churches* or other houses of worship. Neurotics like to go to church (or synagogue). On their travels they are sure to devote the largest share of their attention to these edifices. Of course they have all kinds of rationalized motives (i. e. excuses) for doing so. One wants to admire and study the beautiful paintings, another to hear the church music, a third likes to witness choral services, a fourth finds churches very cool, a fifth delights in watching the "stupid" faces of the worshippers, a sixth is attracted by the stillness of the place and the opportunities for undisturbed meditation, a seventh just happened to pass and wanted once again to get a look at the old business, etc. There is no dearth of excuses, but the fact remains the same.

In quite a large number of cases an enthusiastic *nature love* is only a disguised form of religion. Some of these undertake the perilous task of mountain climbing only that they may be brought nearer to God.

Having reached the summit, they fall on their knees and rapturously exclaim: "How wonderful is nature! How majestic! How sublime!" By "nature" they mean God, and their words are a prayer. Some do actually pray in a kind of solemn awe.

It has for some time been known that behind the common dread of thunder is the fear of an angry God (and results from a guilty conscience.—T.). It is a comparatively easy matter to demonstrate a similar origin for most *phobias*. (Illustrative cases are to be found in Stekel's *Nervose Angstzustände*, 2nd Edition, Berlin, 1912).

These facts are of the greatest importance in the matter of *therapy*. It is one of the psychotherapist's most difficult tasks to overcome this conflict between intellect and emotion. The way to accomplish this differs with each patient. Some frankly profess their religion. Others, and these are the exceptions—succeed in overcoming the remains of their infantile emotions and really become free and independent personalities. In most cases the religious tendency is transformed into ethics. These secret pietists frequently become prominent leaders in various cultural movements. Their ethos becomes their religion. Others take refuge in other religions, become monists, theosophists, spiritualists or Buddhists, and thus satisfy their metaphysical cravings (engrafted upon them in childhood.—T.).

*Art* too is well adapted to take over the religious impulse and to mask it. Many a neurotic suddenly provides himself with a harmonium and plays hymns just because "they sound so solemn" and would resent the imputation that there is a kind of prayer behind it. The physician may take advantage of these tendencies for educational purposes and bring about that compromise between the patient's infantile and present beliefs.

without which a cure is impossible. In doing so the physician must disregard his own convictions. To attempt to strip the patients of their religion or to graft on them the physician's would be to involve them in a new conflict. We must exalt their infantile, puerile and ridiculous conception of God. Genuine piety is inconsistent with most people's conception of the Deity. If they must have a religion, we teach them a kind of pantheism and undermine their anthropomorphic, manichean and sin-oppressed conceptions; the environment and nature's forces are made responsible for some of their sins. But not in all cases will we succeed in this. Many neurotics are cured if they can be made to re-embrace their old beliefs. These matters are often of the greatest importance and determine the result of our treatment.

It cannot be sufficiently emphasized that the *neurotic's belief in the omnipotency of his thoughts, his great religious mission and his Godlikeness must be thoroughly destroyed*. All these prophets, founders of new religions, saviors, and saints must be brought to realize that they are just like other mortals and that *they must renounce their imagined mission* and must be reconciled with the real world in which they live. Among *fetichists* particularly we will encounter individuals who stubbornly cling to their beliefs. The more of such abtruse sexual sins they construct for themselves the more do they withdraw from the female sex. *Fetichism is the refuge from women from ascetic motives*. To a (male) fetichist woman is the personification of sin. The fetich, e. g., a hand, a handkerchief, the hair, etc., serves to fix the libido (libido=sensuous desire.—T.) and thus withdraw it from the female as a whole. The main purpose of these fetichistic practices is to escape from

coitus. *A religious motive lurks behind all asceticism*. Most cases of psychic impotence are only the *stubborn purpose* to ensure a heavenly reward in return for a life of abstinence (and to be exempted from punishment for youthful sins.—T.). Woman appears as the incarnation of wickedness and coitus as the symbol of sin, nay, sin itself. Thus originate those remarkable forms of perversity in which every variety of pleasure is permitted except the immisio penis in vaginam. All attempts to cure these cases by extra-marital coitus end in pitiful failures, whereas the "sacrament of marriage" liberates the most wonderful energies and converts ostensibly impotent men into perfectly healthy and potent husbands.

(In justice to Dr. Stekel and in reply to some of his critics, it may be added that he does not regard the religious "impulse" as something primary or elemental in human nature. He is too good a psychanalyst and too acute a thinker and Menschenkenner for that. He knows as well as anybody that the religious "instinct" is acquired; that behind each individual's God stands his father; that the individual's attitude to God is the echo and reflection of his attitude to his earthly father. If we reduce it to a formula we may say that for each one of us God is our father multiplied by infinity. The atheist's rejection of God as well as the anarchist's or revolutionist's antagonism to royalty and society emanate from the revolt against the father.—T.).

Impotence is an important symptom in sexual neurasthenia. In fact, in the eyes of the patient it is the dominant symptom, and is the one thing which compels the sexual neurasthenic to seek medical advice.—*Medical Summary*. Digitized by Google

## DIAGNOSIS OF DISEASE OF THE MAXILLARY ANTRUM.

BY

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With the newer methods of diagnosis which have come into vogue in the treatment of nose and throat conditions, it is only natural that a great many of the heretofore unexplainable conditions should be more readily diagnosticated. Perhaps no more distressing condition is met with in medicine than the so-called neuralgia in the cheeks or above the eyes. Today in many instances the term neuralgia is merely one of convenience to be used until the cause of the pain has been ascertained. It means no more to the discriminating nose and throat specialist than the term dyspepsia means to the acute internist.

Radiating pains about the face are seldom due to an inflammatory condition of the nerves *per se*. If there is an inflammatory condition of the nerves it is more often secondary to some underlying cause, which one must discover if he wishes to give permanent relief.

In many instances such pains and aches are due to some diseased condition of the maxillary antrum, and it is not only the purpose of the rhinologist to discover whether or not the antrum is diseased, but also to eliminate other causes which might give rise to this condition. Among these may be mentioned the carious and other diseased conditions of the teeth, alveolar abscess, or a paracentritis.

It is not my purpose to go into the general question of diagnosis for this is well known, but to point out certain differential

points which will give one an inkling of the real condition.

Among the aids to diagnosis, are the ability to examine the teeth or to have them examined by a competent dentist, the X-ray examination of the teeth sockets, the examination of the nose for any visible pus, examination of the antrum by transillumination, and the examination of the X-ray plates.

That we may often be misled, even with all these means at hand, is very evident when one comes up against a complex case. The two following cases are indicative of what errors can be made even under the best of circumstances.

*Case I.*—A few months ago I was requested by a dentist to see a young man who had had a severe pain on the right side of his face for four days. Examination of the teeth showed little trouble, and the X-ray plates (Fig. 1) showed a distinct shadow over the right maxillary antrum. At first glance one would have said that this was a case of empyema of the antrum, for no pus was present in the nose. A careful examination of the patient's face showed considerable swelling on the right side, with marked brawniness of the tissues, and an indistinct fluctuation. On lifting up the lip considerable edema of the gums was seen on the right side. On questioning the patient carefully, I found that the pain was dull and boring in character, and more or less continuous. There was none of the strong shooting pains that is often evident in sinus disease, although the X-ray showed a distinct shadow indicating involvement of the antrum. I decided that the case was one of alveolar abscess extending on to the cheek over the antrum, probably due to some necrosis at the base of one of the teeth.

The following day I took him to the New York Eye and Ear Infirmary, where I had a number of men see him, all of whom made the diagnosis of empyema of the antrum. Under gas anesthesia I made an incision along the gingivo-labial fold, into which I inserted a dressing forceps. Im-

mediately there was a gush of extremely foul smelling pus. Under proper treatment, by irrigations and drainage, within a week the condition was entirely cured.

In this case every indication pointed towards sinus disease, and yet it was evi-

*Case II.*—The second case showed points of similar interest. A young man had been suffering for forty-eight hours with a very severe neuralgia of the face, and radiating pains extending up towards the eye. There was considerable swelling of the face on the right side. He went to his dentist, who

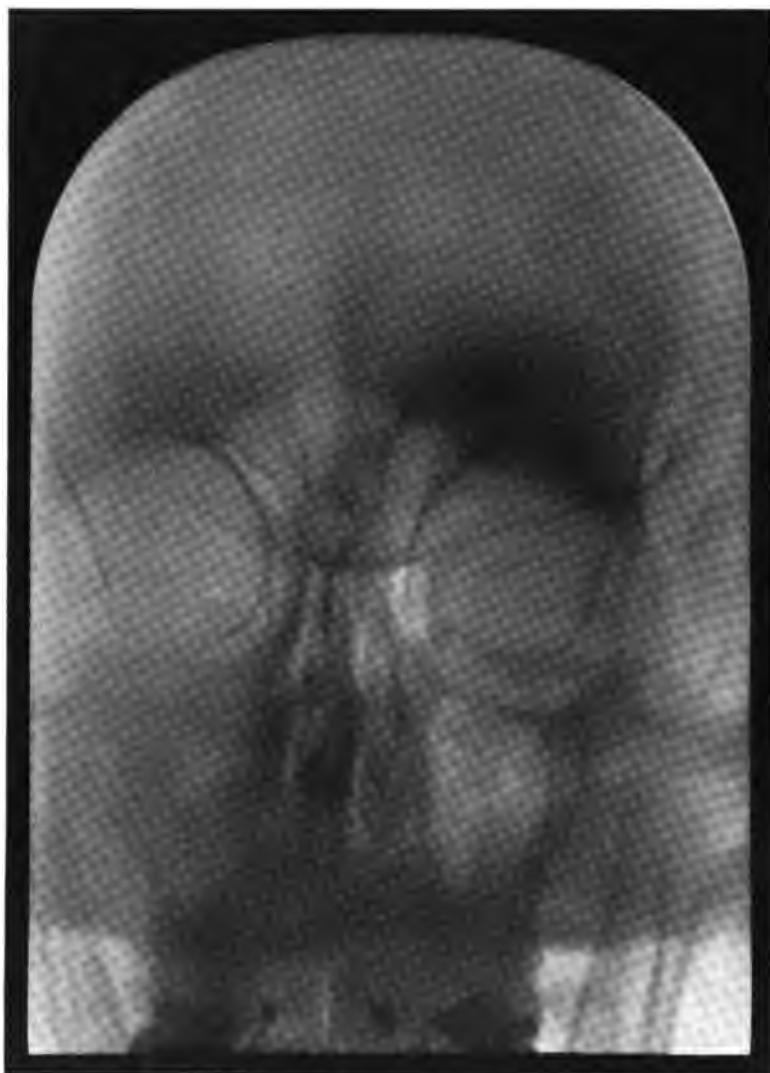


Fig. 1.

dent on careful examination that the antrum was not involved. During the past two years I have had three similar cases, all of which cleared up under proper treatment.

extracted a carious tooth, but his pain did not subside. On examination in my office I found a slight amount of pus coming out from below the middle turbinate bone, and transillumination showed a distinct shadow on this side. A molar tooth which was

covered with a cap was extremely sensitive, and I decided before going further, that I would have him go to a competent dentist, who could take an X-ray picture of the lower portion of the antrum, and the root of this tooth. The X-ray showed disease of the root of the tooth, and also a distinct shadow over the lower portion of the antrum (Fig. 2). Removal of this tooth cleared up the condition within a very short time.

There is no doubt in my mind that the shadow that was shown in the X-ray picture was caused by the inflammatory condition of the mucous membrane in the antrum over the root of the tooth. Fortunately for the patient the root did not extend through the mucous membrane, so



Fig. 2.

that when the tooth was removed the antrum was not opened.

There are very many cases of antrum disease in which the correlation of symptoms makes the diagnosis almost self-evident, but these two incidents are sufficient to show that one must be very careful to eliminate certain other conditions before he positively makes up his mind as to the cause of the trouble. Even with all our accurate methods of diagnosis we are not always in a position to state definitely the cause of the trouble after one examination, and there are certain instances in which we

have made up our minds that the antrum is involved, and yet after opening up this cavity no pus is found. This is illustrated in the following case.

*Case III.*—About a year ago, a young man came to me complaining of severe radiating pains on the right side of his face. All the other signs of an antrum condition were verified by an X-ray examination. I decided that it was necessary to wash out the antrum with the Coakley trocar and cannula (Fig. 3), in order to get rid of whatever pus was present in the antrum. The washing was practically negative; in other words, no pus was found. During the next few days I washed out the antrum five times, and in no instance was any pus seen. On the fifth day he was feeling very little better, and had a temperature of 105. It is very unusual to get as high a temperature in uncomplicated

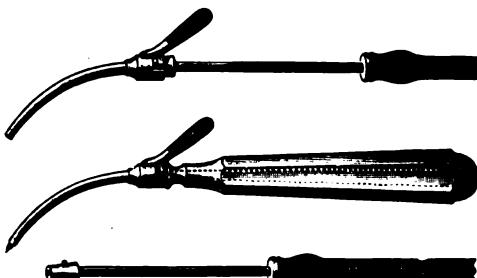


Fig. 3.

antrum conditions. I was not satisfied that I had reached the seat of the trouble, and that afternoon I called Dr. Coakley in consultation. Examination by him showed that a large opening in the antrum had been made, and that sufficient drainage had been established. Washing out of the antrum cavity and the nose with the piston syringe even at this time showed no pus, but we both felt satisfied that an examination of the return fluid would show streptococci. Within the next few days, during which time the patient was very sick, but during which time the pain in his cheek subsided, the patient developed a herpes of the soft palate and symptoms which indicated a general influenzal infection.

Even after the symptoms of an antrum infection have more or less subsided the patient often complains of radiating pains

across the cheek, and a feeling of fulness on this side. There is no doubt in my mind that this is due to the inflamed condition of the mucous membrane, which often continues for sometime after all signs of pus have disappeared. An X-ray picture taken at such a time as this would be decidedly

and then sprayed with cocaine and adrenalin until all the parts, particularly the region of the middle turbinate, can be well seen. Sometimes a drop of pus can be seen exuding from the natural opening of the antrum, but in the majority of instances the nose looks perfectly clean. To the dis-



Fig. 4.

misleading; for a thickened condition of the mucosa will often give as great a shadow as the presence of pus itself.

Among the aids to diagnosis of disease of the antrum of Highmore, one of the most valuable is the use of some form of suction apparatus. The nose should first be well cleared out with some alkaline solution,

eased side then is applied a suitable nasal tip leading into a suction bottle, and suction begun and increased until the patient feels a sensation of drawing within his nose (Fig. 4). This can often be assisted by having the patient swallow, when the soft palate will be brought in contact with the posterior pharyngeal wall. The suction is

kept up for four to five minutes even if there is no drainage into the bottle. Often on examination one can see the pus coming from one of the natural openings of the sinus. Sometimes treatment of this kind, if the opening remains patent, will be sufficient to cure the condition without any operative interference.

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## SUB-ACUTE AND CHRONIC PAN-CREATITIS.<sup>1</sup>

BY

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The typical cases of chronic pancreatitis as described by authors are those associated with jaundice. A tumor may be found in the region of the pylorus if the patient is not very fat, and a preliminary diagnosis of "gall-stones" is often made by the attending physician. The characteristic symptoms of biliary obstruction will be found precisely as in any other form of obstruction of the common duct and we need not mention them. As a rule sugar will not be found in the urine because the condition of the pancreas is an inter-lobular and not an inter-acinar involvement.

When the abdomen is opened the head of the pancreas is the part generally found indurated and nearly every one of these cases resembles carcinoma, thus causing an incorrect diagnosis. The reason this induration of the pancreas causes jaundice is mainly because the common bile duct has been found surrounded and in immediate contact with the gland in at least sixty per cent. of cases, and causes direct pressure

with obstruction. It is but rational to suppose that the condition of the gland is indirectly due to an infection, but one of slow development, as we believe such infections rarely develop into an acute necrosis or suppurate.

Flexner has recently claimed that the injection of bile salts or crystalline principles and coloring matter into the ducts of the pancreas causes acute changes, while the colloids and mucigenous constituents cause a chronic condition.

Accepting this statement as in the direction of fact we yet fail to learn why the head of the pancreas is so frequently found pathological and why drainage of the biliary ways containing bacteria generally cures the patient without evidence of degenerative changes in the gland itself.

**Sub-Acute Pancreatitis.**—One purpose of this paper is to report an experience in this connection with cases of pancreatic disease which do not correspond to the classification of Robson, Moynihan and others. In the writer's opinion, the position of these eminent men is difficult to maintain when they classify subacute pancreatitis as inclusive of all cases with necrosis or with small abscesses yet not belonging to the acute hemorrhagic variety. Nor does it seem appropriate to call an acute attack with fever, great swelling of the pancreas, with pain and tenderness, etc., a chronic affair, even though it respond to treatment or eventuate in complete recovery without suppuration.

One of our cases had typhoid fever with severe pain in the region of the pancreas coming on in the second week of the disease without jaundice and without doubt due to systemic infection. The patient dying of hemorrhage, the autopsy made soon after death not only showed the seat

<sup>1</sup>The author has reported cases of chronic pancreatitis in Wash. Med. Ann., 1902.

of hemorrhage in the intestine, but a condition of the pancreas which any observer would call subacute if any other organ were in question.

There was swelling (hypertrophy) and softening of the gland. The vessels had been greatly dilated and it is possible that self digestion had begun, as mentioned by Adami. There was no indication of inter-acinar disease in this case.

A second case seen in consultation with Dr. Leigh in the third week of typhoid fever (?) is very much like the preceding one yet with a difference. We made an exploratory operation because the patient had a mild infection of her bile ducts which persisted for some weeks after her typhoid symptoms had subsided. During two weeks of her illness this patient had extreme nausea with vomiting, great pain with moderate distension of the epigastrium owing to swelling of the pancreas, but without glycosuria, jaundice, or any evidence of breaking down of the organ. The pancreas was found pale, very soft and small and looked as one might suppose it would appear after time enough had been given to undergo superinvolution. A drainage tube was placed in the gall-bladder and discharged very black bile for several days, which then became normal, the fever disappeared and the patient promptly recovered. In neither of these cases was the gall-bladder itself much if at all involved.

Another case, seen with Dr. Borden, shows how the head of the pancreas may become enlarged and hard—much like so-called "chronic pancreatitis"—but due to direct infection from a duodenal perforating ulcer. The ulcer made its way backward and the pancreas was fortunately located in a position favorable to prevent fatal peritonitis. This patient had a swollen

and somewhat indurated pancreas but was without jaundice and the symptoms were not referable to the pancreas but rather to the digestive system. The fever and acute manifestations of disease had been present but had subsided. A posterior gastro-enterostomy promptly relieved the patient and she has remained well. Not having been able to find reports of autopsies describing these cases of pancreatic disease we have been compelled for the greater part to resort to observations upon the living subject at the operating table. The last case I now present is one of great interest, although the patient was not where opportunity could be had for the scientific examinations of blood, urine and feces, which are so necessary in the analysis of such cases.

*Case 1.*—Miss R. W., white, aged 63, a large well developed woman, weight 160 pounds (care of Dr. Klipstein), was suddenly seized with symptoms of ptomaine poisoning in August, 1913. She had always been an active, healthy person and this illness was entirely without previous symptoms of any disease.

Her physician gave the usual medical treatment for nausea, occasional vomiting and diarrhoea for two weeks until he discovered a tumor in the epigastrium which he thought an enlarged gall-bladder and then requested a consultation, having in view a cholelithotomy.

At this time the patient's condition was excellent. She had experienced much pain but it was not typical of gall-stone colic. There was no jaundice nor pigmentation of the skin, nor lipuria, glycosuria nor steatorrhea. Her pulse had rarely exceeded 100 and her temperature had not reached 102.

The tumor was large enough to distend the epigastrium while the patient was lying upon her back. It was quite tender and pressure caused much pain. A leucocyte count showed 16,000 whites, but no other blood examination could be made. We were quite unable to account for the tumor

before opening the abdomen but confidently expected to find pancreatic disease. Immediately upon opening the abdomen the pylorus, duodenum and pancreas appeared in view and partially protruded through the wound. Examination of the gall-bladder revealed two gall-stones, one of which was very large, but there was no pus in the gall-bladder. Examination of the pancreas from every possible direction indicated carcinoma. The organ was greatly enlarged in every direction. On its lower and posterior surface (approached through the foramen of Winslow and through the mesentery of the transverse colon) it gave the sensation of nodular carcinoma, much like the hobnailed liver, and we were unable to detect the least elasticity or fluctuation at any part of the organ. A rubber drainage tube was placed in the gall-bladder which discharged quantities of bile for nearly a month. The size of the tumor very slowly diminished but it did not disappear for nearly six weeks. The tube was unfortunately allowed to slip out at the end of the third week and was replaced because the temperature showed a tendency to rise. Finally symptoms of bowel obstruction set in, due to adhesions about the upper third of the duodenum and we opened the abdomen and made a gastro-enterostomy. This gave only temporary relief and the patient died of adynamic ileus ten days after the second operation.

At the second operation we made a careful inspection of the organs within the upper abdomen which showed that the pancreas had nearly regained its normal size and that there was no malignancy. The post-operative diagnosis is therefore still in process of formation. For the want of a better name we suggest "subacute pancreatitis" although this may not answer every requirement. Surely the sudden attack with symptoms of sepsis immediately succeeding it does not answer to any chronic condition. The entire organ was hard and the seat of interlobular disease, but we think we could make out the course of the common duct below the head of the pancreas and free from the pressure usually seen in cases associated with jaundice.

The temperature was reduced by drainage of the gall-bladder, but again rose when

the tube came out. Fat necrosis was not observed at either operation.<sup>1</sup>

Archibald, of Royal Victoria Hospital, Montreal, is among those who do not believe in the theory of infection announced by Robson and his school and endorsed by Deaver and others in this country. He well says that "the swelling of the pancreas must be accounted for in that large class in which no gross lesion of the biliary apparatus is discoverable" and he adds that he has failed to grow cultures from all acute and subacute cases and rarely gets an opportunity of obtaining cultures in the chronic form.

**Summary.**—Chronic pancreatitis is that form of swelling or hardening which may be due to a mild infection of the lobules of the organ with "fibrosis" or connective tissue hardening, called "centrilobular" by Adami, without involving the Islands of Langerhans. It is essentially chronic in that its onset is not recognized and it is generally present without the usual symptoms of infection.

Another form of pancreatitis may be described which is characterized by great swelling of the organ with fever and pain, and with either direct or indirect infection (systemic), without necessarily causing jaundice and also without degenerative changes in the Islands of Langerhans. We propose the term "subacute" for this variety. The onset is abrupt and the symptoms severe. Either form may be due to toxic or infectious substances entering by way of the ducts (reflex invasion) by lymphatics, or by systemic circulation. Neither form appears to involve the Islands of Langerhans and hence they are not ac-

<sup>1</sup> The use of the "Cammidge reaction" was not possible, owing to the remote location of the patient in another city.

companied by glycosuria. They are alike in yielding to treatment by drainage.

## SOME OF THE QUESTIONS PRACTITIONERS ASK ABOUT THE WASSERMANN REACTION.

BY

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As a natural preface to any article dealing with the Wassermann reaction it is necessary to consider the principles upon which the reaction is based. The present paper would seem to call for no more than a most brief resumé of details with which every reader of medical journals should be familiar, they are as follows:<sup>5</sup> "In 1901 Bordet and Gengou engaged upon the demonstration of specific antibodies in sera, found that when such an antibody was mixed *in vitro* with its antigen and complement, some reaction took place which resulted in a disappearance of complement from the mixture. This disappearance could be recognized by the addition of another antigen (red blood corpuscles) and antibody (the homologous immune sera). Owing to the disappearance of complement no hemolysis then took place. If, however, the serum did not contain the specific antibody of the antigen, the complement did not disappear from the mixture, and on subsequent addition of hemolytic amboceptor and corpuscles, hemolysis took place." Wassermann, Neisser and Bruck in 1905, and Wasserman, Neisser, Bruck and Schucht in 1906 applied the Bordet-Gengou phenomena to the demonstration of syphilitic antibodies in the blood sera of apes and humans. Perfection of technique by various laboratory workers eventually

enabled the clinician to add the Wassermann reaction to his diagnostic armamentarium.

Of what value is the Wassermann reaction to the practitioner?—It may indicate or eliminate syphilis as the etiological factor in obscure conditions. It helps diagnosis. It, in a measure, controls treatment.

A question frequently asked is—How soon after infection will a patient give positive reaction?

It would defeat the purpose of a paper of this nature were the conflicting opinions of many workers cited. On the other hand it seems that one should be able to arrive at fairly logical conclusions, if the findings of a few recognized observers, selected at random, be examined and their results averaged. The length of time between infection and positive reaction is obviously somewhat difficult to ascertain. Boas examined the sera of twenty-nine cases and found positive reaction to occur in from four to twelve weeks after exposure, six weeks being the average. More satisfactory are statistics concerning the occurrence of positive reaction in the primary stage of syphilis, as reported by three serologists.

	No. of cases	Positive, %
Boas .....	76	73
McIntosh .....	27	74
Noguchi .....	33	66.6
	136	71.2%

Why does positive reaction not occur immediately after infection? (For the sake of simplicity the term amboceptor will be used to designate that body which, produced by the action of spirocheta pallida, unites with antigen in the fixation of complement). The infection at first localized produces changes insufficient to be recognized from examination of blood serum by any methods now at our command. As the spirochetae multiply and the amount of tissue involved

increases there is, almost without exception, a coincident increase of amboceptor until sufficient is produced to give positive reaction. The rapidity and amount of amboceptor formed varies with different individuals but those cases which do not give positive reaction during the eruptive stage of the secondary period are extremely rare. In fact they occur so infrequently that we are not asked what the percentage of positive reactions may be during the secondary period, but why they are not invariably obtained. Examining again the records of the three observers above quoted it is found that their reports are:

Name	Untreated cases		
	secondary period	Positive %	
Boas .....	269	100	
McIntosh .....	92	84	
Noguchi .....	120	94	
	481	92%	

Such data require some analysis. With all respect to Boas whose adaptation of Wassermann technique is used by the writer, no pathological condition can be invariably diagnosed by test tube methods, as Boas's subsequent observations probably show. The results of McIntosh are taken advisedly because they are so low, and it must be said in justice to this excellent serologist that his later results show almost 100% positive, during the secondary period of the disease. When one considers that Noguchi tabulating the results of eleven observers found an average of 89% positive, the 92% obtained above does not seem so low. It must be remembered however that the patients examined were probably not all in the eruptive stage. In the early stage of the secondary period it seems to the writer that 97% positive reactions should be secured and as the patient progresses toward the tertiary period, probability of positive reaction from blood

serum will gradually decrease. Negative reactions obtained during the eruptive stage of the secondary period are plausibly explained as occurring when infection is so overwhelming that the body offers no resistance and in consequence produces no amboceptor. Against this theory is the natural query—what becomes of amboceptor formed during primary period and up to time infection no longer produces resistance? Certainly some amboceptor and at least sufficient to give positive reaction should be formed during the gradual dissemination of infection. Perhaps a more tenable theory is that these individuals are amongst the few that offer at no time a resistance to this particular form of infection, the phenomenon is observed with other infections and there seems to be no reason why syphilis should be an exception.

Why is percentage of positive reactions lower toward the last of the secondary period than during the eruptive stage?

This applies to reactions obtained from blood serum and two possibilities must be considered: Treatment and accustoming of tissues to a given form of stimulation. As Prof. Taylor frequently said "the first symptom of syphilis is a lie" and as every one knows probability of treatment must always be considered when interpreting Wassermann reports during this and later periods, regardless of what history may be given. Not necessarily coincident with decrease or continuation of symptoms there may be a diminution of amboceptor production, as the tissues accustom themselves to infection and action of sprochetae pallida, until insufficient exists to give positive reaction.

In discussing reactions obtained during the late secondary, tertiary and latent periods several difficulties present them-

selves. As there may be a difference of opinion as to when these periods occur there must be a corresponding allowance made in accepting Wassermann reaction statistics. Also the probability of reaction being influenced by treatment, as has been before mentioned, increases as time elapses between infection and examination.

*Frequency of Positive Reaction in Tertiary Syphilis.*—Noguchi, tabulating the results of eleven workers, found that 78.1% positive reactions were obtained in examination of blood serum from 581 cases of manifest syphilis. It is to be presumed that these were not all untreated cases for had they been no doubt a higher positive percentage would have been recorded. Some serologists claim that divergence of clinical and laboratory opinion during this period is due to inaccuracy of clinical diagnosis. Such a view is consoling to the serologist but it was expressed before the importance of spinal fluid examination was recognized.

At this point it is well to consider the value of spinal fluid examination, it being of course understood that the Wassermann reaction alone is under discussion.

In an interesting and instructive paper on "The Cerebrospinal Fluid in Syphilis," Ellis and Swift record results and arrive at conclusions concerning this comparatively new field, that are worthy of close study as they are principally in accord with the observations of other refined workers along the same lines.

Secondary syphilis untreated—22 cases, sera 100% positive, spinal fluid 100% negative.

Secondary syphilitic meningitis—8 cases, sera 50% positive, spinal fluid 60% positive.

Cerebro-spinal syphilis—21 cases, sera 62% positive, spinal fluid 94% positive.

Tabes dorsalis—30 cases, sera 66% positive, spinal fluid 86% positive.

In conclusion the writers consider examination of spinal fluid essential both in prognosis and treatment in the secondary stage, in diagnosis of any syphilitic condition of the central nervous system, to confirm negative reactions of sera before patients can be discharged as cured. When one remembers the affinity which tissues of the central nervous system appear to exhibit for spirochetae pallida the importance of these conclusions may be appreciated.

*Information to be Gained from the Wassermann Reaction During the Primary Period of Syphilis.*—For designating the character of reactions a variety of terms are in use, many of them ambiguous. As an instance the term "became slowly negative" conveys no information as reactions must be positive, indefinite or negative within certain recognized time limits. To indicate negative reactions the sign — is used, to indicate positive reaction the signs +, ++, +++, +++, according to the strength of reaction-inhibition of hemolysis. As plus, double plus, etc., readings are arrived at in several ways it may be readily seen that the further away from single plus or positive-negative border line the more apt a reading is to be correct. It is not advisable for physicians to accept plus-minus or one plus reports in doubtful cases, negative reports in the face of positive history and physical signs, or single positive reports when unsupported by history or physical signs. If a suspicious lesion exists a double or stronger positive report confirms diagnosis, a negative report does not indicate that the patient is free from syphilitic infection. When laboratory and clinician do not agree it is better for the clinician, if he desires laboratory confirmation of diagnosis to have a second examination made in one or two weeks.

*Significance of the Wassermann Reaction in Secondary Syphilis.*—It is obvious that during the eruptive stage one should not be influenced by negative report. Diagnosis is as a rule so self evident that recourse to the laboratory is not necessary. In the later stages double plus or stronger reactions indicate that the infection is producing active resistance. Doubtful or weak positive reactions convey little or no information. Negative reactions if repeatedly obtained from blood serum and spinal fluid may be regarded as indicating that the patient has either overcome the infection or that insufficient amboceptor for complement fixation is being produced.

*Significance of the Wassermann Reaction in Tertiary and Latent Syphilis.*—During these periods negative serum and double plus or stronger spinal fluid reactions indicate syphilis. Double plus or stronger positive serum and negative spinal fluid indicate syphilis. Negative serum and negative spinal fluid indicate that the patient may be either free from syphilis or that infection is not sufficiently active to produce positive reaction.

*Effect of Treatment Upon the Wassermann Reaction.*—It should be remembered that after injection of salvarsan or neosalvarsan there occasionally occurs what is called a provocative reaction. That is, a serum which has been negative will for a time become positive. It is explained that in these cases the drug administered has a transitory stimulating effect upon the spirochetae and amboceptor production is increased. As a rule positive reactions gradually become negative, the rapidity with which this occurs varies with different individuals. Exceptional cases are occasionally encountered that remain positive notwithstanding intensive treatment by every

means at the sphylographer's command. Such patients, according to Kaplan, eventually become paretic. As an arbitrary rule examinations may be made every two months for a year after the cessation of treatment. The writer does not feel that a serologist, with the diagnostic means now at hand, is ever justified in pronouncing a once syphilitic patient as being free from infection.

*Effect of Alcohol Upon the Wassermann Reaction.*—From experiments made by Craig and Nichols the administration of 90-100 c. c. of alcohol (whisky) to nine individuals having double plus reactions resulted in the reaction becoming negative in all of them within twenty-four hours after the alcohol was taken. In one case the reaction did not become positive again until the end of three days, while in the others the serum became positive within thirty-six hours. Recruited as our clinics are from a class addicted to the use of alcohol and who habitually deny it, no doubt some reactions are materially influenced by this agent.

*Effect of Narcosis.*—Boas and Peterson took blood from 30 known non-syphilitic patients during chloroform narcosis and found no positive sera.

*Conditions Other than Syphilis Which May Give Positive Wassermann Reactions.*—Dourine, sleeping sickness, yaws, recurrent fever, leprosy chiefly in the tuberose form, and some cases of scarlet fever have been found to react positively. The reaction is however transitory and by some serologists considered as obtained by faulty technique. Richards in an interesting paper reports 4 cases of diabetes with acidosis as giving positive reactions. Two cases showing no acetone were negative as was also one case exhibiting acetonuria.

In conclusion it must be said that Wassermann reactions should only be attempted by trained serologists and the information which they convey applied by experienced clinicians. Ignorance on the part of one or both is principally responsible for the existing confusion regarding this valuable diagnostic aid.

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#### HEAT OR LIGHT FOR GONORRHEAL INFECTIONS.

Hot irrigations for gonorrhreal arthritis were successfully used empirically by J. Van R. Hoff of the Army many years ago, the water being passed into the deep urethra by a catheter and allowed to escape. This was kept up for an hour or more. The results were most excellent.

Impressed by the low thermal death point of the gonococcus ( $113^{\circ}$  F.) and the necessity of avoiding irritating astringents, Chas. E. Woodruff tried frequent irrigations with normal salt solution as hot as the patients could bear. Sometimes the water was considerably over  $120^{\circ}$ , some men can stand  $130$  or even  $140^{\circ}$  (*N. Y. Med. Record*, 1901). The results were so excellent that the method soon became a routine in many clinics.

Dry heat is almost a specific in acute or chronic gonorrhreal arthritis and has been

used for very many years, the last important contribution to the literature being by Grünspan and Faroy (*Gaz. des hôp.*, No. 26, 1910). They used air at  $257^{\circ}$  F. ( $125^{\circ}$  C.) for 25-30 minutes.

Dr. J. A. Fulton has adopted this plan successfully in the treatment of gonorrhreal urethritis. He devised a special double current catheter in which he passed water at  $120^{\circ}$  to  $130^{\circ}$  F. for 20 to 30 minutes (*Med. Rec.*, Feb. 12, 1912).

Now come Majors L. W. Harrison and G. J. Houghton, R. A. M. C. (*Jour. Roy. Ar. Med. Corps*, Feb., 1913) with an independently devised method of using dry heat. They state that the upper thermal death point is only  $104^{\circ}$  F.

"The instrument consists of a silver catheter (No. 9 or 12 English), with no opening at its distal end; into it is passed another catheter (No. 2), which is open at both ends, the distal end being about an inch from the corresponding end of the enclosing catheter. The two tubes are soldered together at their proximal ends so as to make a water-tight union, and the inner tube projects an inch or so from the outer. The latter is provided close to its proximal end with a short branch tube to lead away the water. The water from an irrigator flows down a suitable rubber tube (which is provided with a clip) to the inner metal tube of the instrument and is conducted by it almost to the distal end of the enclosing catheter, by which it returns to the branch tube; to this is attached another rubber tube to conduct the water to a bucket.

The treatment is applied as follows: On the previous evening and the same morning an atropine suppository (gr.  $1/_{75}$ ) is administered, and before the bougie is passed the urethra is irrigated in the usual manner. The patient is then placed on a couch and adequately protected with a water-proof sheet. The sterilized and lubricated bougie is connected up to the rubber tubing leading from the irrigator, which is itself placed about 18 in. above the couch and filled with water at  $114^{\circ}$  F. The bougie is then gently passed into the bladder and the clip opened to allow the water to flow from the irrigator. The temperature of the water in the irrigator is raised to  $118^{\circ}$  F. by adding more hot water to it, and after a few minutes it is gradually raised in a similar

manner to 121° or 122° F. After two or three more minutes the temperature of the water in the irrigator is again gradually raised to 125° F., and this is maintained for five to ten minutes. At this temperature the outflowing water is generally 118° F. At higher temperatures than this blistering of the meatus may follow.

There is naturally great discomfort when the bougie is first introduced, and the patient bears the maximum temperature with considerable difficulty, but after seeing the results in the first few cases all our patients have submitted willingly to the treatment.

We have also used for the same purpose an electrically-heated bougie devised for the treatment of urethral stricture by Dr. Ph. Kobelt (*Münch. med. Woch.*, No. 30, 1912). With this instrument, which is provided with a thermometer, it is possible to regulate the temperature to a nicety so that it can be increased very gradually.

**Results.**—We have treated in this way sixteen cases, eleven acute, with profuse purulent discharge, and five subacute or chronic, with watery discharge, and have made many microscopical examinations of the urethral secretion; in all cases this contained numerous gonococci before the treatment was commenced. The most striking effect has been the rapid disappearance of the gonococci in most of the cases. In six (four of them acute), none could be found by the fourth day after the first application of the treatment; in two (one acute) they finally disappeared on the seventh day; in another (acute) they did not finally disappear till the eleventh day, but only a single pair could be found on the seventh day. In two cases (acute) massage of the anterior urethra on the fourth day failed to produce any secretion and no microscopical examination was made; in two (subacute) microscopical examination was inadvertently omitted till the sixth and thirteenth days respectively, when no discharge could be obtained.

As to the other elements, the chief feature has been an immediate increase of mucus and epithelium, the latter to a slight extent.

Clinically, in all cases the discharge has changed at once to muco-purulent or muco-serous."

Dr. Hermann Strebel (*Archiv. of the Roentgen Ray*, May, 1907) has successfully treated chronic gonorrhea with glow-light, but the length of exposure, difficulty of introducing the light into the urethra and the complicated cooling apparatus seem to have rendered the method impractical. It is well known that the strong Finsen light does not injure the tubercle bacilli below .2 millimeter in lupus, because they are so well protected by the red color of the blood. The light merely acts as an irritant as described by Jensen of the Copenhagen Institute and Mally of Paris. The cure is probably due to the bactericidal power of the serum poured out in response to the irritant, as in the Bier treatment of other infections by passive congestion. The same explanation must be given for the remarkable results obtained by Strebel. In a discussion of the subject at the Academy of Medicine (*Med. Rec.*, 1901) the late Ferd C. Valentine of N. Y., stated that the good effect of heat was not due to its bactericidal action but to that of the serum poured out in the tissues which become temporarily swollen after each treatment. Practically the same explanation was given by Ballenger of Atlanta (*N. Y. Med. Jour.*, July 2, 1909). He says that the good effect of hot rectal douches in prostatitis is probably due to raising locally the opsonic index and promoting a freer flow of blood through the infected tissues. Zinsser (*Berlin. Klin. Woch.*, May 18, 1908) used a strong stream of 1-4000 permanganate at 45° to 50° C. in chancre and chancroid, and the resulting hyperemia was probably the cause of the rapid disappearance of pain, odor and necrotic tissue. Mechanical cleansing of course assists here as in the urethra. Some think that the distention of the urethra is just as important, but there is no distention in the use of dry heat by a small catheter. Nor can weak solutions have much bactericidal effect—none at all on the deep seated cocci. Indeed, Reclus got excellent results in old ulcers with hot water, and Veyrasset with hot saline solution at 50° C. (*N. Y. Med. Jour.*, Oct. 25, 1905), and so have thousands of others.

Heat is almost an universal remedy in gonorrhea throughout the world, even among Filipinos. Many healthy men are

immune to this infection, and Valentine said (*Jour. Amer. Med. Assn.*, Nov. 23, 1908) that many women are. So many cases get well without treatment or in spite of it, that the general impression seems to be that it is a self limited disease as a rule, and that the natural powers only need a little help such as heat. It is often charged that the irritating drugs prevent recovery. Perhaps a return to simplicity may be in order.

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### THE FORTHCOMING MEETING OF THE INTERNATIONAL SOCIETY OF SURGERY.

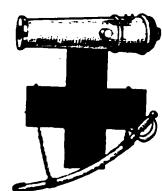
For the first time since its organization a Congress of the International Society of Surgery is to be held in America. The fourth meeting of this Society will take place in New York from April 13th to 16th and it is expected that it will be largely attended by well known European surgeons, including a large number of French and Belgian scientists. Up to the present time the attendance of surgeons representing the English speaking race has been meagre. In the British section in the last Congress only 24 were present. Dr. Lucas Championniere presided at the Brussels meeting in 1911, and his recent death will be felt severely as he was a moving spirit in the arrangements and a prominent factor in the success of previous meetings. However, Professor Depage of Brussels who is the president for this year, will compensate largely for the loss of Dr. Championniere. Professor Depage was the secretary of the last congress, and it was greatly due to his untiring zeal that it passed off so well. The Congress will be opened at 11:30 A. M. in the Hotel Astor on April 13th by the President of the United States. The scientific proceedings will commence at 2:30 of the same day with a discussion on the Surgery of Gastric and Duodenal Ulcer. Reports on Grafting and Transplanting of Organs will be given on the following day and on April 15th, reports on Amputation will be read and discussed. A feature of the meeting, as it has been a feature in this country of all recent surgical meetings will be the clinics. Operative demonstrations will be held in the various principal hospitals. The discussions

will only be open to members of the Society, which numbers about 600 of the most eminent surgeons of the world, but non-members can attend the meetings and it has been further decided that surgeons who are not members, will be permitted, on the recommendation of the delegates of their respective countries, to share in the special arrangements made for the journey. With regard to this, it has been arranged that the Hamburg-American steamer *Imperator* will leave Hamburg on April 2nd, calling at Southampton and Cherbourg enroute for New York, while the *Rotterdam* will leave Rotterdam on April 4th calling at Boulogne. The local Secretary is Dr. J. P. Hoguet, 40 East 41st St., New York City and the American Committee is composed of Dr. Roswell Park (deceased) of Buffalo, Dr. L. L. McArthur of Chicago, Dr. C. L. Gibson of New York City and Dr. R. H. Harte of Philadelphia. These last three and Dr. Rudolf Matas of New Orleans and Dr. R. G. LeConte of Philadelphia constitute the committee designated to represent the American Surgical Association in making preparations for the entertainment of the foreign members. Among the prospective entertainments are a special invitation lunch, tea and dinner on the opening day, a luncheon to be given by Mrs. Mayo on the 14th, a subscription banquet on the 15th, and from the 16th to 28th excursions to Philadelphia, Baltimore, Washington, Chicago, Rochester, Buffalo, Niagara Falls and Boston. Among those who will discuss the three main topics are Dr. Querudin of Basel, Hartmann of Paris, Mayo of Rochester, Minn., Moynihan of Leeds, Payr of Königsberg, Morestin of Paris, Villard of Lyons, Ullmann of Vienna, Lexer of Lena, Carrel of New York, Witzel of Dusseldorf, Cecil of Pisa, Kuzmik of Budapest, Binnie of Kansas City, Durand of Lyons and Ranzi of Vienna. The European members have been invited to attend the session of the American Surgical Association to be held in New York at the Hotel Astor on April 9, 10 and 11 and many have signified their intention of so doing.

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A "sentinel" pile is a skin tag situated on the anus posteriorly, and always means fissure. Abscess and fistula follow a neglected fissure.—*Int. Jour. of Surgery.*

# THE ANNOTATOR



**An Attack on the Red Cross.**—Another attack upon the Red Cross has caused that organization to take the defensive again.

Miss Edith Durham, a Balkan war correspondent, is quoted as saying in London that the wounded and sick who were cured by the Red Cross Hospitals immediately returned to the ranks. Thus the aid which was given as a purely dis-

interested charity, really became a means of prolonging the war. Humanity begot inhumanity. This has been quite a shock to the public but the facts have been known for a long time to the initiated. Miss Mabel Boardman while admitting the facts theoretically, stated that the \$400,000 expended by the Red Cross was such a drop in the bucket compared to the whole cost of the war, that there could have been little effect. Still, that much money could restore a lot of soldiers to a fighting condition. The interesting point has been ignored in the press dispatches. If the Red Cross is such an aid to efficiency, it must throw off the cloak of neutrality and be counted in the military resources of a country and dealt with like every other army agency. It will be justifiable to capture it and put its materials to use; indeed, if a commander needs its supplies he could be shot if he did not use them. War is hell, and the experience of the world is to the effect that the hotter it is, the sooner over. Fierce bloody brutal wars destroy fewer lives than long humane ones. The fact is, the Red Cross was devised when there was no good organized medical department to cure the wounded and is still used in lieu of one, as in Russia; but it has become a useless anachronism elsewhere—actually a nuisance which has to be coddled with protection and transportation sadly needed to haul food and bullets. Its modern role is drifting to a

means of temporarily aiding people overcome by disasters such as floods, conflagrations, and earthquakes, when the local machinery is wrecked. It has amply justified its existence in peace, but in war, experience shows that a trained medical department is more efficient and the Red Cross useless except at a distance from the front, and the further back the better.

**Testamentary Egotism.**—The study of the brains of normal and eminent men is a necessity, not only for the advancement of anatomy and physiology but for possible discoveries leading to better and surer surgery. Our material for study has been almost exclusively the failures who would otherwise go to the Potter's field. We have long been urging all men, big and little, to will their brains to research workers for this purpose. It is therefore not pleasant to read in the dispatches from Europe, that the act of Alphonse Bertillon in leaving his skull by will to the Academy of Medicine was an act of "testamentary egotism." Such an act does not indicate any more egotism than the implication that the testator does not consider himself either a failure or abnormal. There was every reason why Bertillon should do as he did without the slightest egotism. He was one of three famous sons of a famous father, and it was only natural that his lifelong studies in anthropology should impress upon him the need of more study of those above the average to supplement what we know of those below it. We want also the brains of just plain, average everyday, ordinary sort of men, though we must confess that this is the type which most desires to be



like the common herd and which is last to break the conventions. They want to be buried like their ancestors, and fear being called egotistical or abnormal or eccentric. It requires a big man or a very little one to break conventions and we will have to do without the average.

### The Influence of Rural Living on Childhood Health and Physiques.—The bad



health and defective physique of country children has been known for a long time, and we have also known of the large death rate of the rural districts. The dreadful conditions are not due to country life, but in spite of it.

Too many farmers are too ignorant or stupid to adopt modern sanitation. We have long called attention to the worst of them, whom we have classed as "filthy farmers," because they have been largely responsible for so many infectious diseases brought to cities by the filth in foods, particularly milk. An outraged urban population is now aroused and will demand a reform. If the criminals cannot be compelled to clean up they will be quarantined on their own premises and forbidden to sell any food to anybody. That seems radical but it is what the future has in store for them. We cannot allow ourselves to be murdered—for it is really murder now, as in the last typhoid epidemic in New York City. The matter is now being brought home to the farmer's family. Dr. Thomas D. Wood of Columbia University has called attention to the investigation of rural schools by the National Council of Education in cooperation with a special committee of the American Medical Association. They found the sanitary conditions unspeakably bad, and seventy-five percent of the children needed a doctor—somewhat larger than in the worst of the cities. In almost every disease or defect, the country children were afflicted in from 5 to 20 percent larger numbers than urban children. Even in lung diseases 3.7 percent are afflicted, whereas only a fraction of one percent of city children are. The underfed city children show malnutrition in 23.3 percent, but among children on the farm where the food is raised 31.2 percent are undernourished.

Adenoids bother 21.5 percent of them, but only 8.5 percent in the city. In Idaho 43.9 percent have enlarged tonsils, but only 8.8 in twenty-five cities. Dr. Wood shows that all these diseases are preventable and are due to the unwholesome insanitary conditions surrounding the children in home and school. They are overclothed in their hot, stuffy homes, and underclothed outdoors, they live in dirt and are criminally neglected in acute illnesses. When city children were so badly treated, their condition was appalling and their country cousins appeared good by contrast only. The present city rates show what can be accomplished by sanitation in spite of bad environment. For most types of children, the country is infinitely preferable. A large proportion of city babies died only a few decades ago. We now save them, but it remains to be seen whether they grow up with that vigor and physique which is necessary for efficiency. If we can form any judgment at all now, it is to the effect that we are only postponing the extinction of these types a generation or two. We cannot judge much of death rates because they vary with birth rates. Since babies furnish a large percentage of deaths, much of the reduction in death rates is not due to modern sanitation but to the fact that fewer babies are born to be killed by bad sanitation.

### The Health Affairs of France and Germany.—French and German sanitation have been brought into strong contrast by



the simultaneous debates in the German Reichstag and French chamber as to the alleged high sick rates in the respective armies. The French military authorities have been calming public excitement by figures showing that the proportionate amount of sickness was essentially the same as for many years, though the death rate per 1,000 sick was higher than any year since 1908. The German soldiers have about half the death and sickness of the French and yet the legislators are incensed that there should be even that much. The French are brilliant in making discoveries but are a very impractical people in applying their knowledge. The slower, more plodding, less brilliant Germans see the practical applica-

tion of French discoveries and put them to use. The awful prevalence of typhoid fever in France is accepted there as a matter of course, but it would cause a near-revolution in Germany. It seems that public opinion which is the real basis of sanitation, is better informed in Germany than in France. That is, there may be fewer very brilliant men per million Germans, but they have fewer who are indifferent. The Swiss side of Lake Geneva is a model of sanitation, but the French side is disgraceful. Perhaps every nation has something to admire and something to condemn. America has such a criminal record as to typhoid and smallpox, that we sympathize with the French and envy the Germans.

**Noise as an Etiological Factor.**—Noise and Neurasthenia are being connected as cause and effect in Paris, and several members of the Academy of Sciences are discussing the matter seriously with the view of abating the nuisance and advising everyone who can to run away from it if it can not be diminished to endurable limits. The anti-noise crusade has been carried on largely for the benefit of people who have been made neurasthenic from other causes. They are exquisitely sensitive to noises which the normal ignore. To them the sounds are real traumata which have the same effect on nerve cells as any other mechanical injury. Recovery may not only be prevented in noisy surroundings but the disease made actually worse. The new idea is that healthy people suffer the same traumatism and though they have strength enough to ignore it, the effects accumulate and finally make themselves felt to even the most stolid. Many have said all this before, but no one has attempted to give specific instances until Edmond Perrier, Director of the Paris Museum of Natural History, accused the habitual noises as being the cause of the neurasthenia so common among travelling mail clerks, printers, type setters and typewriters. This is an unfortunate illustration, for the nerve strain of forced attention when fatigued, and working in hot rooms are fully com-

petent to account for the exhaustions. If any eye-strain exists, and it generally does, the results come on more quickly of course. Barbers who are not troubled by great noises are as badly affected, while boiler makers do not figure so largely in it if at all. We are afraid that Perrier has not made out his case. Nevertheless, the damage of noise seems appreciable, and it is likely we will be able to show it statistically in time. The anti-noise crusade is a worthy one, and we hope it will not die of inanition, but be revivified to the end of abating all the unnecessary sounds which now jar our tingling nerves. Tug-boat captains declared that they could not get along unless they used their whistles for about everything including the calling of the crew from a saloon, but they were wrong and have become fairly decent in preference to going to jail. It is time to stop other street cries and unnecessary noises, so that a needed signal of danger may be low enough to attract attention and yet be unirritating.



be diminished to endurable limits. The anti-noise crusade has been carried on largely for the benefit of people who have been made neurasthenic from other causes. They are exquisitely sensitive to noises which the normal ignore. To them the sounds are real traumata which have the same effect on nerve cells as any other mechanical injury. Recovery may not only be prevented in noisy surroundings but the disease made actually worse. The new idea is that healthy people suffer the same traumatism and though they have strength enough to ignore it, the effects accumulate and finally make themselves felt to even the most stolid. Many have said all this before, but no one has attempted to give specific instances until Edmond Perrier, Director of the Paris Museum of Natural History, accused the habitual noises as being the cause of the neurasthenia so common among travelling mail clerks, printers, type setters and typewriters. This is an unfortunate illustration, for the nerve strain of forced attention when fatigued, and working in hot rooms are fully com-

**Euthanasia.**—Once again euthanasia is up for discussion. *The Journal of the American Medical Association* mentions the case of an apparently moribund incurable woman who begged to be killed as her sufferings were unbearable. Yet she did bear them, and is now happy and healthy, thanks to a surgical operation. A few months ago a German lay magazine created quite a bit of notoriety for itself by strongly advocating a law permitting the painless execution of incurables who request it. It of course suggested an intricate machinery for establishing the fact of incurability, but German physicians must be made of different clay than the rest of us if they are willing to give such a verdict or even serve on such a jury. Besides, there are to be severe penalties if the post mortem examination shows that the departed might have had a chance. In our best hospitals we are told that nearly four-fifths of post-mortems show something which was unsuspected in life, and a jury to determine incurability would have one chance in five



of being absolutely correct. Besides all this, a person in agony is not capable of forming a correct opinion, and his request to die can be given no more weight than the statements of a tortured witness. It is amazing therefore to learn that a very large number of Germans are said to approve the suggested law. Perhaps life is not as much worth living in Germany as America, and we do hear of an appalling number of suicides of children and young people. As for physicians, they should know that we can always end pain without ending life. Ancient Germans sacrificed the aged and infirm as the least of two evils, for everyone was too busy keeping himself alive to have a minute to spare for the helpless. Old men were cast into a river to appease the wrath of the river-god for erecting a bridge, and they asked to be killed as life was not worth the living and death was an honor. Nowadays life is too good to lose a minute of it, so let's make the best of it, even when ill.

America, and particularly for New York State. When Saratoga is in working order on modern plans, it will be time to warn people that the waters are not a cure for everything from corns to baldness.

**Sub-infection.**—This is a new term invented by Dr. J. G. Adami, Professor of Pathology in McGill University, to account for the diseases which Sir Wm. Arbuthnot Lane ascribes to absorption of intestinal poisons in stasis. (*British Medical Journal*, Jan. 24, 1901). Adami ob-

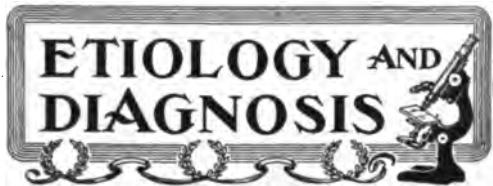
jects to the term auto-intoxication except in reference to poisoning by substances manufactured by body cells. There is an intestinal intoxication, of course, but that is due to bacterial action which is really outside of the body. Sub-infection might be a good term to denote these processes in which the intestine is merely a culture tube and none of the tissues are injured but it seems like splitting hairs to make the distinction. There is much opposition to the theory that the products of normal digestion are injurious, and that stasis by permitting more absorption of them is of moment. Here is where there is legitimate ground for discussion. The work of Metchnikoff leaves little doubt that colonic absorption can do a great deal of harm. Still that little doubt does exist and the matter is open for discussion. Practically there will be little difference what the final consultation will be, for if a high degree of stasis causes no signs or symptoms of disease, as not infrequently is the case, the person does not consult us, and if there are lethal conditions which are evidently colonic intoxications, we will not hesitate to remove the cause even if we must remove the colon itself. Adami is afraid of an epidemic of operative surgery, but that fear may be dismissed as the operation is so serious that no one will resort to it without momentous reasons.

### The Rescue of Saratoga Springs.—



Fortunately this is becoming an accomplished fact. The State has paid a million dollars for the mineral water rights and 250 acres of land. Paths, drives and parks are under construction, and we should soon be in possession of a health resort as good as most of those in Europe if not better. Dr. Simon Baruch of New York to whom the people are indebted for this movement has long been saying that these springs are the same as some famous ones abroad and should give equal therapeutic results. He has recently had the assistance of Dr. Paul Haertl, chief of the laboratories at Bad Kissengen, Germany, and has personally studied all of the prominent European health resorts. Of course there is an enormous amount of quackery in European Spas, and they have been given credit for cures due to other things or even suggestion, but making allowance for all that, the good accomplished by scientific balneo-therapy and its adjuncts is too well attested to ignore any longer. We are glad that Dr. Baruch has done so much for

Thymol iodide, formerly known as aristol, is a cheap yet effective antiseptic, useful in powder and in oily solution, and particularly beneficial when applied to granulating surfaces.



### Bacteriemia, Infections and Bright's Disease.

—In accordance with investigations covering a period of four years the writer (Dr. W. C. K. Berlin, Denver, Colorado, *Medical Record*, Feb. 14, 1914), is convinced that most, if not all, the forms of nephritis known as Bright's disease, are preceded by a true infection, and may occur as sharply acute, mild, or of an insidious beginning. The latter may produce no marked symptoms and may only be found to be present accidentally, as in the examination for life insurance or other routine examinations.

Intestinal fermentation and intoxication seem to be responsible for blood-pressure changes only, and this condition is not associated with kidney disturbances of this character, except mechanically, as in other organs. Confirming this, we see many cases of high blood pressure unassociated with kidney complications of any kind; conversely, cases observed (one in particular) had an albuminuria of long standing with the sphygmomanometer registering a subnormal pressure.

It is true one may find both infection and intoxication present in an attack of nephritis with high blood pressure, but the infection is the cause of the nephritis and the intoxication of the high blood pressure. Intestinal fermentation may be responsible mechanically, in the beginning, for a later infection of the kidney by causing a distention and intestinal stasis, allowing the migration of bacteria. This same fermentation with distention and stasis may cause a toxemia later with blood pressure changes. The distinction drawn from the foregoing facts is that all forms of nephritis are originally infectious and all true blood pressure changes are from toxemias.

The only true elimination of the waste matter of the blood stream occurs in the kidney cells, and these organs are so constructed that in their function there is present more likelihood of infection at this point than at any other during a blood stream infection.

**Conclusions.**—The transition of an acute nephritis to a chronic form is simply a clearing up of an inflammatory process, leaving an injured kidney with a beginning degeneration or Bright's disease.

If the urine was segregated in every case of Bright's disease and placed on culture media one might expect to find colonies of the different pathogenic bacteria.

The origin of Bright's disease is a true infection.

The toxemias are not the cause of Bright's disease.

Toxemias or autointoxications are responsible for blood pressure changes only.

More work is necessary along these lines by the profession to prove the above contentions,

so that treatment can be administered accordingly, and which, of necessity, would vary greatly from the set treatment now in vogue for Bright's disease, as it is now understood.

**The Pathology of the Thyroid Gland in Exophthalmic Goiter.**—Dr. Louis B. Wilson of the Mayo Clinic discussed the subject in the *Amer. Jour. of the Med. Sciences*, Dec., 1913, and comes to the following conclusions:

"1. A detailed pathological study of fixed tissue preparations from 1208 thyroids, removed from patients whose condition would ordinarily have been diagnosticated exophthalmic goiter, showed that 79 per cent. of the thyroids contained large areas of marked primary hypertrophy and hyperplasia. A parallel clinical study has shown that for a period of three years all cases with true exophthalmic goiter, and from whom gland tissue was removed, fall into this list.

"2. In the above series of 1208 so-called 'exophthalmic goiters' plus 585 so-called 'simple goiters,' or a total of 1793 thyroids, but 4 instances of marked primary hypertrophy and hyperplasia of the parenchyma have been noted in cases which did not show clinical symptoms of true exophthalmic goiter. Three of these four patients were children.

"3. Twenty-one per cent. of the 1208 glands studied were either regenerations or adenomas. Clinically, while all of these were markedly toxic, all were chronic and none of them would now be grouped clinically as true exophthalmic goiter.

"4. By assuming that the symptoms of true exophthalmic goiter are the results of an excretion from the thyroid, and by attempting to determine the amount of such excretion from the pathological data, one is able to estimate in a large series of cases the clinical stage of the disease with about 80 per cent. of accuracy and the clinical severity of the disease with about 75 per cent. of accuracy.

"5. It would therefore appear that the relationship of primary hypertrophy and hyperplasia of the parenchyma of the thyroid to true exophthalmic goiter is as direct and as constant as is primary inflammation of the kidney to the symptoms of true Bright's disease. Any considerable finding to the contrary I believe to indicate either inaccurate or incomplete observations on the part of the pathologist or clinician, or both."

**The Value of the Wassermann Test.**—Dr. E. A. Fischkin, Chicago, Ill. (*Clinical Medicine*, Jan., 1914). The Wassermann test, during the few years of its use, has stood the test of time. It is now universally agreed and proven by hundreds of thousands of tests, made the world over, that a positive Wassermann reaction practically shows the presence of syphilis, and that a negative Wassermann may, under certain conditions, enable us to exclude syphilis from the diagnosis of a disease. Clearly it is not necessary, at this time, to dilate

upon the value of the Wassermann test as a method of diagnosing syphilis.

The Wassermann test is only a part in the diagnostic chain of symptoms of syphilis. It has a value only in conjunction with the other symptoms of the disease. It is corroborative evidence. It can never serve as a safe basis for diagnosis when not supported by clinical evidence of syphilis or when contradicting clinical symptoms. Without the knowledge of recognition and interpretation of clinical symptoms the physician will often be confused and misled by the Wassermann test. Whatever value we shall give to the Wassermann test, it must be performed by reliable and most approved methods. The most reliable method, as agreed by most clinicians and serologists, is the original Wassermann. Modifications, when used, must complicate and increase the labor of the test, not shorten it. Short cuts and snapshots have no place in this work.

a broad bandage. This is left on for three hours, and should be carried out four times a day

Every morning the patient should take a cachet containing 5 grains of freshly powdered ergot and 8 grains of bi-hydrochloride of quinine. From the beginning of the illness, without waiting for the least sign of failure, hypodermic injections of camphorated oil should be given systematically.

R Camphorae .....	3ij.
Olei Olivae .....	3i
Misce.	

D. D.

One drachm of this should be injected three or four times a day, and continued until defervescence occurs, when the amount and number of doses can be gradually reduced, and given up when complete recovery is obtained. Cardiac tonics must also be given from the outset, even when the heart's contractions are vigorous. Twenty drops of digitaline should be given on the second day of the illness, and 10 drops on the three subsequent days, or it may be given in the form of infusion of digitalis, which must be freshly prepared (10 grains of the freshly powdered leaves steeped for 12 hours in cold water [ $\frac{1}{2}$  pint] and filtered). This quantity is taken in two or three doses during the day, each dose being sweetened with a tablespoonful of:

R Syrupi Convallariae,	
Syrupi Adianti .....	ana 3ij.

Misce.

This treatment is continued for three days, the doses being decreased by degrees, using 2 grains less of digitalis each day. On the 5th day, when the digitalis is left off, two hypodermic injections of the following should be given, using minims xv for each dose:-

R Strychninae Sulphatis .....	gr. $\frac{1}{3}$ .
Sparteinae Sulphatis .....	gr. iv.
Aquae Destillatae .....	3iss.

These injections are continued until defervescence.

If low tension and myocardial weakness continue to be marked in spite of digitalis and sparteine, injections of caffeine in 4-grain doses should be given twice a day. A useful addition to this is 15 to 20 drops of the solution of adrenaline (1 to 1,000), given by the mouth or by hyperdermic injection. Finally, the best method of acting upon cardiac asthenia is to place an ice-bag upon the precordial area, or cold compresses wrung out in iced water frequently renewed. The retention of chlorides in this disease is a reason against the use of large injections of serum, sometimes advocated. Hyperpyrexia, especially if accompanied by excitement and delirium, is best treated by hot baths (98-100° F.), repeated three or four times a day and lasting for a quarter of an hour. The injection of metallic ferments, except intravenously, is not of much service in the pneumonia of old people, and even an intravenous injection is of less value than in other cases of pyrexia. After defervescence, convalescence is often slow and difficult, calling for the use of strychnine, glycerophosphates, lecithin, and other restoratives.



**Treatment of Pneumonia in Old People.**—According to a French writer (*La Progres Medicale*). Keep the patient in bed, but in a half-sitting-up position, to prevent passive congestion at the bases of the lungs. The room must be well aired. Eucalyptus or Friar's Balsam should be used in a steam-kettle to keep the air moist and to promote expectoration. The mouth and naso-pharynx must be kept clean by douches or gargling with oxygen-water diluted to one-tenth, formol 50 c.c. in 1 litre of water, or the following solution:

R Chloralis Hydratis .....	3iij.
Spiritus Menthae Piperitae .....	3ss.
Spiritus Vini Rectificati (90°).....	3iv.

Misce. Flat mistura.

"Half a teaspoonful in a glassful of warm water."

The diet should consist of milk, milk-soups, eggs, and meat-juice. The total amount of fluid absorbed in the 24 hours should not exceed 1,500 to 1,800 g. (2½ to 3 pints). The food must be dechloridized. Alcohol in large doses is required: sixty g. (3ii) of cognac or rum, or 8 to 12 ounces of wine.

Dry-cupping should be carried out over the chest, morning and evening; in strong, full-blooded old people wet-cupping over the pneumonic area should be done. If the dyspnea is urgent the cupping should be replaced by moist applications of mustard, applied by completely surrounding the chest, back and front, with several layers of gauze which have been well wrung out after being soaked in warm water in which is suspended mustard-flour. When in place a covering of oiled silk should be put on and the whole kept in position by

**Treatment of Psoriasis.**—The treatment of psoriasis (*Med. Press and Circular*, Jan. 7, 1914) is internal and external, and requires equal attention. It is well known, says Prof. Gougerot, that auto-intoxication plays an important role in the development of cutaneous affections, hence the necessity of submitting a patient with psoriasis to general treatment, taking into account the constitution of the individual. If he is of arthritic, gouty, nervous, dyspeptic temperament, the treatment will vary accordingly, but, generally speaking, a lacto-vegetarian regime more or less severe, according to the intensity of the eruption, will be ordered.

As to drugs, excepting arsenic, they are practically useless. Arsenic in the form of Fowler's solution, Eau de Bourboule or arseniate of soda, may be given in judicious doses. Extract of the thyroid gland has been prescribed of late years with some success.

It would be well to remember that these patients are considerably dimineralised; consequently it is necessary to furnish salts of lime, chloride of sodium, phosphates to the system.

Carbonate of lime, 10 grs.

Phosphate tricalcic, 7 grs.

Magnesia cal., 1 gr.

Chloride of sodium, 1 gr.

For one cachet, three daily.

The local treatment, which is very important, cannot be identical in every case. According to the intensity and more or less great extent of the eruption, and, above all, according to the more or less integrity of the emunctories, the treatment employed will be more or less energetic.

For instance, in cases of generalised psoriasis with large red patches indicating great irritability of the tegument, the treatment should not be too active. The medical attendant will content himself with prescribing anodine ointments (oxyde of zinc) and starch baths. When irritation has more or less subsided, a more energetic treatment may be instituted. As a commencement, a weak cadic ointment is applied:—

Oil of cade,

Oxyde of zinc,

Talc powder,

Oil of sweet almonds, aa.

After a few days of this treatment, the reductive ointment of Gaucher may be prescribed:—

Sulphur, 15 grs.

Camphor, 15 grs.

Salicylic acid, 15 grs.

Oil of cade, 3 drs.

Oxide of zinc, 5 drs.

Vaseline, 1 oz.

The patient will apply it at bedtime, and wear drawers and a jersey, which he will change but once a week.

In the morning he will remove the ointment with soap and take a bath as follows:—

Oil of cade, 4 oz.

Black soft soap, 1 oz.

Water, 1 pint.

To be added to the bath.

The patient will remain as long as possible in the bath, half or three-quarters of an hour, after which he will dry himself and proceed to his occupations. At night the ointment is to be re-applied.

At the end of 10 or 12 days of this treatment the condition of the patient is much improved; a certain number of patches have paled out, the eruption is diminished completely.

At this period the doses for the baths can be increased if the patches are disseminated, or the ointment if they are localised. For the baths chrysarobine may be added provided the kidneys are in good condition.

Oil of cade, 4 oz.

Yolk of eggs, No. 2.

Extract of quillaia, 5 drs.

Chrysarobine, 15 grs.

These baths are taken twice a week.

At this period Drew's ointment may also be applied, but only over small surfaces (a hand palm):—

Salicylic acid, 3 drs.

Chrysarobine, 5 drs.

Vegetable tar, 5 drs.

Green soap, 1 oz.

Vaseline, 1 oz.

The ointment is put on at night.

At this point the patient is in a good way to recovery; only isolated patches are found, some in the hair, some on the elbows, etc. The treatment necessarily changes; one bath a week is now sufficient, for baths have already lost a great deal of their utility. The local patches will be treated with traumaticine and chrysophanic acid contained in two separate bottles. The first is a solution of gutta-percha and chloroform:—

Gutta-percha, 1 dr.

Chloroform, 9 drs.

The second:—

Chrysophanic acid, 1 dr.

Ether, 9 drs.

(Inflammable).

After removing as much as possible the squamae or scales by dry rubbing with a towel, the place is washed with soap and dried, the chrysophanic solution is applied with a brush on the patch of psoriasis taking care not to exceed the limits of the lesion. This solution dries quickly, leaving a fine deposit of the acid; then the traumaticine is painted over the surface and a little beyond the limits of the patch, thus realising an occlusive dressing. At the end of two or three days the patient recommences the operation.

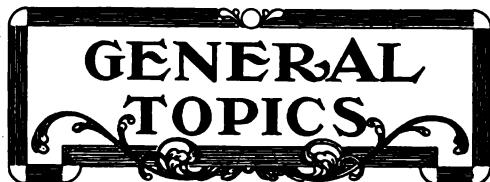
Where the patches are rather large the cadic collodion of Gaucher should be preferred.

Pure cade oil, 3 drs.

Collodion of acetone anhydrous, 5 drs.

In psoriasis of the scalp, chrysarobine cannot be employed on account of its irritating effects on the eyes; it also colors the hair yellow! For dark-haired persons, the ointment of Gaucher may be used or the yellow oxyde of mercury ointment (1-10) and washing the scalp now and again with oil of cade soap.

For children neither pyrogallic acid nor chrysarobine should be used on account of their toxicity; weak oil of cade ointment or naphthol alone are advisable.



**American Medicine Moves to New Quarters.**—Owing to the urgent need for larger and more commodious quarters, the editorial and executive offices of AMERICAN MEDICINE have been moved from 84 William St. to 18 East 41st St., New York City. During the six years AMERICAN

CAN MEDICINE. A special feature of the new offices is the library which is to be maintained for members of the editorial staff. This will contain several thousand of the latest medical works, and a remarkably complete file of the principal American, English and European medical publications.

Eighteen East 41st St. is one of the most accessible locations in New York City and only a very short distance from the new Grand Central Station. Medical men coming from out of town who are strangers in New York City are cordially invited to call at AMERICAN MEDICINE's offices for any information they may desire relative to hotels, hospitals, clinics, post-graduate courses, etc., etc.



MEDICINE has been under its present management remarkable progress has been made in every department. The circulation has been increased over 50 per cent as a consequence of aggressive up-to-date methods, and AMERICAN MEDICINE stands to-day one of the most widely read medical journals in the country.

The new editorial and executive offices are delightfully arranged to facilitate the many and constantly increasing details attached to the business and editorial direction of AMERI-

**A Woman's Number.**—*The Medical Review of Reviews* proposes to issue a number in May that will carry nothing but articles by medical women. In fact the whole number is going to be turned over to a special corps of women editors and the publication of the entire issue left to them. This is an interesting experiment but owing to the splendid abilities of our medical women no fear can be entertained as to the outcome.

# American Medicine

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and

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PUBLISHED MONTHLY BY THE AMERICAN MEDICAL PUBLISHING COMPANY.

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Complete Series, Vol. XX, No. 4.  
New Series, Vol. IX, No. 4.

APRIL, 1914.

\$1.00

YEARLY  
in advance.

The internal secretions have passed from the stage of academic discussion to that of great practical value in therapy. The profound modification made in youth by excision of the ovaries or testicles had convinced the profession long ago that the matter was important enough to put to practical use. A crude organotherapy grew up and is still practiced though it was unfortunately tainted by a near-quackery which well nigh destroyed its scientific standing. Its originators saw through a glass darkly, but scientific medicine must be face to face with facts before it stamps its approval on anything. Sajous set himself the task of finding the facts and putting them squarely before the profession, which promptly ignored them as it does every new thing of value. We get burned so often by the fire of false theories, that we almost dread innovations. The tide has now turned and the rush is in the opposite direction. We may confidently predict that the new converts will soon make extravagant, baseless claims, coincidences will be considered results and real results overlooked. But there is no use worrying over all that in advance. The cause for congratulation is the fact that an enormous field has been opened up, fenced in and prepared for cultivation. Able husbandmen have already entered but the crops will not be full until they clear out the old roots

and underbrush, and will not be perfect unless they sow the right seed. The present endeavor then, is not to establish the fact that there are many interrelated, complementary or antagonistic internal secretions, but to find out the exact way they act, then isolate the pure substances and put them to work. The papers in the present issue show what enormous progress has already been made.

**Hypothyroidism** has been fully explained in a notable series of addresses recently delivered in this country by Dr. E. Hertoghe of Antwerp, the great pioneer in this special field of the internal secretions. His discovery of the immediate cause of cretinism and myxedema reads like a romance. He had a case of alleged uremia without the urinary signs of chronic nephritis, and by a strange fate was asked to care for a case of goitre in a relative, and if it became necessary to remove the tumor. That very day, a new surgical work reached him, and in looking up the latest information as to goitre, found that a total removal of the thyroid was sometimes followed by the identical symptoms of his puzzling case of alleged uremia. An ordinary man would not have seen any correlation, and as a fact every generalization has depended upon the

power of keen observation of a very extraordinary man. After the relation of cause and effect was suspected, the rest was easy. Hertoghe now finds that milder grades of hypothyroidism are exceedingly common in his country, and has found a similar though we hope not so serious a prevalence in America. At one meeting he said that some of the great men in the room would be greater still if they had a little more thyroid, and indeed he pointed out some very marked cases. Since the thyroid substances stimulate metabolism, their absence allows collection of wastes and superabundant fat in any part of the body, so that the signs and symptoms are legion.

**The cause of hypothyroidism** must be discovered, now that its presence has been recognized. Cretinism and myxedema seem to be endemic in certain localities and innumerable attempts have been made to discover a cause in the soil or water, not a few having blamed the hardness of the water in limestone regions. Too much or too little calcium has been made a scapegoat of everything under the sun when we were too ignorant or lazy to find the real culprit. The eugenists jumped on the problem with all four feet shouting "heredity," but did not tell us how these lines started. Something must have made the first case appear in a healthy line, and perpetuate it. Robert McCarrison seems to have made a beginning in unravelling the puzzle. In a recent article (*Lancet*, March 21, 1914) he has described his experiments which have convinced him that the failure of the fetal thyroid to grow is due to bacterial intestinal toxins in the mother and carried to the fetus through the placenta. Goitrous mothers also have non-bacterial toxins because of their sluggish metabolism, hence

a small percentage of their children are born cretins, 63 per cent. goitrous (32 with parathyroid disease), and only 33 per cent. are normal. Hertoghe says that there is some unknown relation between intestinal stasis and myxedema, thus adding one more link to the long chain of pathological conditions traced to the colon by Metchnikoff and Lane.

Cretinism and myxedema are no more hereditary than is an injury inflicted after birth. A woman who is alcoholic or tuberculous may do far more damage to her fetus with these poisons—indeed ruin them, but this is not heredity either.

How quickly we are drifting to the position that everything abnormal has an immediate cause and nothing is hereditary except the good that is in us! The era of prevention is here already. Let's get to work to prevent what our fathers called "the will of God."

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**The exact prophylactic value of typhoid vaccine** is gradually becoming known. The British Army Committee found that no protection is conferred on those who are specially susceptible to typhoid fever. What immunity is developed in other people is effective for a while but generally wears out within two years. Early reports compared the recently inoculated with the unprotected and led to the false assumption that the immunity was universal and lasting.

The splendid results in nurses must be partly due to the fact that they have fewer cases to nurse, and are more careful to avoid the danger. In New York City, even the unprotected nurses now have but little typhoid.

In the meantime, the tremendous strides made by sanitation began to show results which were also erroneously attributed to the vaccine. This is a serious matter since it tended to discredit the means which have so markedly reduced typhoid fever elsewhere. An analysis of the early reports now shows the errors. For instance, the statistics reported by Dr. A. G. Love of the Army (*Military Surgeon*, March, 1913) show that there was a phenomenal reduction of typhoid fever in the army before 1909 when the vaccine was introduced, and in the following two years the reduction was much more than the percentage of vaccinations. The wonderful work of the army sanitarians was evidently keeping infection from the troops, because in India where infection cannot be easily avoided the disease did not decline so markedly. Love erroneously concluded that the American vaccine was better than the British. The sanitarians in the Indian Army reduced typhoid far more than could be accounted for by the percentage of vaccinations which can never be depended upon to eliminate typhoid as first thought. It seems settled that as a rule typhoid infections contracted after vaccination are mild and deaths rare, yet curiously enough the case death rate in the British and American armies among the unvaccinated rose considerably after the introduction of the vaccine—as though short fevers formerly considered typhoid are now properly classified. At one time in India no cases were called typhoid, and at another, every fever was so classed—if not obviously something else.

**The contra-indications to typhoid vaccine** will prevent its wide acceptance and

confine its use to times and places of epidemics when and where it may be practically impossible to avoid typhoid. It is now reported that the vaccine incidentally causes a reduction of immunity to other organisms, particularly the pyogenic bacteria and tubercle bacilli. Suppurations and tuberculosis are quite common sequelae of typhoid fever, and though far less numerous after inoculations, are common enough to condemn the vaccine except in persons who are in the very best of health. No one can detect the early stages of tuberculosis and the risk of lighting up an unrecognizable lesion is too great to ignore unless the danger of getting typhoid is much greater. We may all be tubercular, though perhaps in only one per cent. or less are the lesions active enough to be disturbed by the vaccine, and even then recovery may be quite prompt unless the man is in bad surroundings or exposed to fatigue and chilling. About one in five hundred or a thousand do not recover, but go on to recognizable incipiency. The puzzling cases are those in whom the infection has not yet reached the lungs but is still confined to the peribronchial glands. Any latent or chronic disease may be made worse by the vaccine, even carcinoma and diabetes. In the latter, tuberculosis is quite common anyhow, and may be quickly fatal if the vaccine is administered. Children have not yet developed full immunity to tuberculosis and, as they may be infected already, the vaccine is wholly out of the question for them. It is only less dangerous for college students. Women seem to take the vaccine badly since many female nurses have bitterly complained of symptoms suggestive of glandular tuberculosis and lasting several months after the vaccination.

The action of the vaccine in latent tuberculosis is much the same as that of tuberculin and many unsuspected cases have been thus diagnosed or traced to the vaccine. Dr. Parks of the City Laboratories is reported to have said that as he had never heard of such cases, he proposed to go right along administering the vaccine. The dangers have repeatedly been published, and he should follow up his 5,000 cases to discover the harm. Otherwise there will be a scandal.

**Opposition to compulsory typhoid vaccination in the French army** is very bitter among both civilian and military physicians. According to *La Caducée* of April 4, 1914, the parliament recently passed such a law in great haste, without debate and failed to refer the bill to the Academy of Medicine as is the rule in all matters relative to public health. This has caused great indignation, particularly since the Academy had already decided against such a measure and recommended its optional use by soldiers. The government made no objection, the minister of war did not consult his committee of health, nor his superior committee of hygiene and epidemiology, but a sub-secretary of state took it upon himself to jam it through, presumably for the political purpose of silencing those who were criticizing the government for the high sick-rate of the army. In the chamber, the bill was not referred to the committee on hygiene but to that on the army, and the vote was taken when the former was absent on another investigation. Even the governmental representative of the department of health was not heard. The Society of Public Medicine and the "Syndicat medical" of Paris strongly protested, saying it was the government's

duty to force sanitation on the filthy towns of the south which have been causing the disease. All agree that the measure should be obligatory in Morocco, and when an epidemic appears at home, but say that it is foolish to inoculate in advance as no one knows how long the immunity lasts. The Medico-Legal Society recognizing the possible dangers stated that it should be omitted in case of medical contraindications.

**Professor Vincent's contradictory statements as to the dangers of typhoid vaccine** are receiving serious criticism. For two years, and as late as Nov. 5, 1913, at the Provincial Sanitary Reunion, he had been calling attention to the danger of giving it to any except those in perfect health, preferably the young who have not had typhoid. It should not be given to convalescents, the fatigued, or even those in doubtful health, and surely not to those with digestive troubles, albuminuria or tuberculosis. In the latter it acted like tuberculin. In March, at the Academy of Medicine and also at the Society of Public Medicine, after the bill had passed, he denied that his vaccine did any damage to those with winter complaints—grip, bronchopneumonia, scarlatina, tuberculosis, etc., as found by Chantemesse. Indeed he said that his vaccine improved some suspected of apical lesions, though he believed that a vaccine killed by heat did make tuberculosis worse. It is unfortunately true that tuberculosis has not declined with typhoid in the American Army, and that in 1912 the first year after the compulsory use of the vaccine, the cases developed so rapidly that 24% of those discharged were considered not in the line of duty and deprived of pension. Granjux, the editor of *Caducée*,

says that tuberculosis is a *noli me tangere* and the danger with recruits is the impossibility of detecting such contraindications in the short time available, and that bad results are far less where it is optional with soldiers of longer service, though he approved the compulsory use in epidemics. He says that his medical correspondents in the army, who have evidently studied the matter at first hand, are unanimous in opinion that the new law is most dangerous, one of them adding: *Timeo vaccinatores et dona ferentes.*

**A warning against life-insurance typhoid circulars** has now become necessary because they have accepted the early optimistic reports as to the vaccine and have not kept in touch with the dangers later discovered in France. Particular reference is had to the leaflets put out by the Postal and Metropolitan Life Insurance Companies. The former says that "there is little inconvenience and no danger." It is an axiom of pathology that secondary infections are serious because the primary one has prepared the soil by reducing the antibodies normally present. Pus organisms we easily resist in health are the cause of death in smallpox and often run riot after Jennerian vaccination. The tetanus bacillus also has a free field during vaccinia. The typhoid sufferer is an easy victim of almost every other infection. Any vaccine will do in minor degree what is done by the disease it prevents. Indeed that is the theory of its prophylactic use, yet the Metropolitan circular says the vaccine is "absolutely without danger to healthy persons." They should have known that no one can detect incipient diseases, for all companies pay for many early deaths of policy holders who were diseased when

insured, though apparently healthy. The statement that "typhoid fever can be driven from the country by typhoid inoculation" is absolutely false, and if tried will be followed by a dreadful aftermath of tuberculosis. It is a distinct shock to find such bad advice coming from these companies, when we had all so confidently predicted their great opportunities for prolonging life. It is now evident that these men who have devoted their lives to diagnosis and prognosis, have had no time to keep in touch with means of prevention and cure. All physicians should warn their patients to ignore the dangerous advice of these two companies in this direction.

As far we know, the *Journal of the American Medical Association* has carefully excluded from its columns all references to the dangers of typhoid vaccine. There is no question that those who are greatly exposed to typhoid should be inoculated, such as nurses in charge of typhoid patients or soldiers campaigning in endemic territory, but these are selected classes free of disease, and the risk of tuberculosis is far less than in the general population. The vaccinationists have become so obsessed with the good, that they cannot see the harm, even overlooking and suppressing the deaths they have caused. They make the childish defense that these cases are mere coincidences. It is an open secret in France that cases of typhoid in the vaccinated have not been reported. The Germans do not think it has any practical prophylactic value, and have ignored it.

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**Some more governmental medical tyranny** has come to light in the arrest of the manager of a large pharmaceutical company, for sending heroin by mail to a drug-

gist who had ordered it. This company is of the highest ethical standing and its products are used throughout the world. The action has been denounced as a "high handed and outrageous interference with personal liberty and professional rights." Is a physician to be considered a criminal because he sends heroin by mail to patients desperately in need of it? Is some petty governmental ten-dollar-a-week clerk to be given power to determine the morality and legality of our professional acts? The case illustrates what we have frequently mentioned of the tendency of official medicine to become officious. It shows the public danger lurking in the proposition to put powers in the hands of a national public health department. It begins to look as though the average governmental employee has not sufficient intelligence to be trusted with matters involving the lives of our patients. These evils are so great and so dangerous that it would be a great calamity if a national health department is to be created and allowed to continue the present policy of arresting those whose professional ethical code differs from that of the authorities. This is not Russia. Supplying a drug to the few who misuse it is a trifling evil compared to preventing the saving of the lives of the far more numerous sick who need it. So far it is evident that the law is vicious or the governmental agency in question is not competent to administer it with common sense. In either case the law must be repealed, and all future laws regulating interstate traffic in drugs, be limited to the prevention of adulteration and substitution—and be made fool-proof at that. It might be wise to investigate the officials guilty of the present outrage, to see if their

great talents would not be more profitably employed in private life. At least we are entitled to know why our servants have acted like our masters.

**The great prevalence of bovine tuberculosis in Scotch children** has been reported by Dr. A. Philip Mitchell (*British Medical Journal*, Jan. 17, 1914) who found that in 72 cases of tubercular cervical glands of children in or near Edinburgh, the bacilli were of bovine type in ninety percent. He blames the use of unsterilized milk from tuberculous cows which are exceedingly numerous in that district. This news will certainly be appreciated both by those who want to sterilize all milk to prevent bovine tuberculosis and also by those who think that it would be better to let all children get this disease to immunize them against the human form. Without pretending to criticize Mitchell's findings we cannot help suspecting that there is something wrong in the diagnosis. There are so many kinds of tubercle bacilli, and each kind is so easily modified from the typical form, that the chances of error must be quite large. It would not do to base sanitary measures on a single report like this one. So many investigators have reported the bovine form to be quite rare, that we cannot sweep them aside without consideration. The question will be open for a long time yet.

**Are one-third of our milk cows tuberculous?** It is reported that the N. Y. State Agricultural experts have so decided and have also said that there are no physical signs in 95 per cent of the cases. This

is curiously like the state of affairs among human beings—every one tubercular but few developing signs and still fewer symptoms. Now let there be some painstaking examinations made to see if all milk cows are tubercular. If we can draw any conclusions from our own bodies it is safe to predict that practically all cows will be found to have lesions. If so, we are faced by the possibility that we have been eating meat from tubercular cattle all our lives. The cows do not seem to mind being tubercular. If they are relieved of the drain of frequent pregnancies and almost constant lactation, they fatten up at once. Indeed it is charged that condemned tubercular cattle are deliberately "cured" and fattened for the market and that some institutions are supplied largely if not entirely this way. Hygienists have been saying for fifty years that such meat is harmless if cooked, there being no injurious toxins which survive the heat. Nevertheless the practice had better be stopped as no one wants to eat meat from animals so far advanced that the disease is recognizable. One's feelings must be considered even if the incipient cases supply the rest of us with food. Evidently we are on the eve of a marked revolution in our ideas as to the prevalence and harmfulness of tuberculosis in milk cows.

It was a happy coincidence that Dr. Eugene Hertoghe should be visiting this country as the guest of Dr. Wm. Seaman Bainbridge, one of the country's foremost surgeons, just as this issue devoted to the internal secretions was going to press. Dr. Hertoghe's investigations of the thyroid gland and his published reports thereon are among the most important and far-reaching contributions that have been made to modern medicine during the last half century. His addresses delivered during the past month will not soon be forgotten by those who were fortunate enough to hear them. One of these, especially prepared and arranged for this issue of AMERICAN MEDICINE will be read with great interest by thousands of medical men, who will welcome the opportunity of thus learning Hertoghe's latest views on the pathogenic influence of thyroid inadequacy.

Dr. Bainbridge deserves the sincere gratitude of the American medical profession for his part in inducing Dr. Hertoghe to visit this country. Without fear of contradiction we can say that of the many great physicians who have come to our shores in recent years, few have brought a message so profound and far reaching in its influence on medical practice.

In concluding we wish to express our regret that delay in getting return proofs, especially from our English contributors, made it impossible for us to arrange the papers of the symposium in just the order we originally planned.

To those who have helped us to make this a truly noteworthy issue we extend our heartiest thanks. It has been a great privilege to publish so many papers, not only of sound scientific worth, but of real literary merit.

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The articles in this number, it will be generally admitted, constitute the most important series of contributions on the subject of the internal secretions that has ever appeared in any publication. No medical man can read these remarkable papers without gaining a wealth of new ideas concerning the diagnosis and treatment of many obscure pathological conditions.



## MEN AND THINGS



**Egbert Le Fevre.**—The death of Dr. Egbert Le Fevre on March 30th is a great loss to the medical profession of New York City. He was born in Raritan, N. J., Oct. 29, 1858, graduated from Rutgers College in 1880 and New York University Medical College in 1883. After an internship of two years at Bellevue Hospital, he soon became recognized as a particularly able internist and diagnostician, and was so sought after as a con-

sultant that he soon acquired an international fame. He was made lecturer on the practice of medicine 1888, Professor of Clinical Medicine in 1890, Adjunct Professor of Medicine in 1895 and Associate Professor of Therapeutics in 1898 in the New York University and Bellevue Hospital Medical College, and was chosen dean in 1898. He was made visiting physician to the City Hospital in 1894-5 and to Bellevue in 1898, and was consulting physician to Beth Israel Hospital when he died. His work on "Physical Diagnosis," published in 1902, is still a standard. He was a fellow of the New York Academy of Medicine, member of the American Medical Association, New York Pathological Society, American Climatological Society, and the National Association for the Study and Prevention of Tuberculosis.

It is generally conceded that to his genius as an organizer and teacher, Bellevue owes its enviable position among the medical schools of the world. Added to these remarkable talents was the still more remarkable personality which endeared him to patients, students and friends. He spent his life in their service and some say he wore



himself out with his good works, so that when he contracted scarlet fever probably from one of his own patients, he had so little reserve force that he died in four days. He was tall and large of frame, and his mind was in keeping with his physique. His views of life were comprehensive, and this probably added to the native geniality and sympathy which made him so attractive to those with whom he came into contact. Not for many a year has a New York physician received such eulogies as were spontaneously uttered upon learning of his untimely death. We had every reason to believe that the college would benefit from his services for many years, and we join with his confreres in their mourning.

**Joseph D. Bryant.**—The death of Dr. Joseph D. Bryant of New York City on April 7, at St. Vincent's Hospital, removes



a man who was noted in so many ways that his life and achievements should be an inspiration to every medical student who has brains but no money. He was born on a farm—and a poor one at that, so it is said,—in East Troy, Wisconsin, March 12, 1845, but early determined to make something of himself.

The public schools began his training which was continued in the Academy at Norwich, N. Y., and he graduated from Bellevue Hospital College in 1868. In 1869 he became an interne and ever since has been connected with that institution as teacher or surgeon. He was sanitary inspector for the city from 1873 to 1879, and health commissioner of



DR. EUGENE HERTOGHE,

From AMERICAN MEDICINE.

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*In every group of men there are some whose eyes are ever searching the heavens for far off, undiscovered worlds; others, impelled by forces they cannot resist, seek the ultimate in the trackless wilds of the jungle or the barren wastes of the polar regions; still others will always be found standing on the shore peering out to sea for the ship that is to bring them honor, glory and wealth. And yet, close by on every side, there are short untrodden paths leading to wonders and treasures untold.*

*A few there are in every community who can see the necessity of exploring these unbeaten lanes, and lo, before they know it, they have opened up vistas undreamed of and exposed riches never known to exist. And while the people are enjoying the benefits, the marvel grows that they were achieved so easily!*

*Dr. Hertoghe is a man who saw fit to explore a nearby path. Patiently, unobtrusively, but with the devotion of the true scientist, he took up the study of a single gland of the body—the importance of which was only half suspected—and as a result has been the means, not only of saving countless lives, but of restoring many a sorely afflicted individual to a healthy, useful existence.*

*Truly, Hertoghe's career shows us how close by are the paths that lead to success.*

*H. E. L.*

the city or state from 1887 to 1893. He did much to correct bad sewage systems and insanitary conditions, but his greatest claim to fame was the rebuff he gave to those merchants who objected to the measures he took to keep out cholera. In such times, some of these men openly state that they don't care how many lives are lost by commerce, providing they themselves make money by it. "You will stop commerce," they whimpered. Bryant calmly replied, "I don't give a continental, but I'll stop cholera." It was this strength of character which made him a great man.

He was the surgeon of the 71st regiment from 1873 to 1882, and surgeon-general of the state until 1894. He was the author of an "Operative Surgery" which went through several editions, and was joint editor with Dr. Albert H. Buck of the "American System of Surgery." He was more widely known among laymen for his intimate friendship with President Cleveland, and it has only recently been said that one of their frequent boat trips was taken for the purpose of removing an oral malignant growth which Mr. Cleveland was anxious to keep from public knowledge. They stayed away until the wound had healed and the secret was carefully kept. He had much to do with the consolidation of the medical schools of Bellevue and New York University in 1898 and was professor of operative clinical surgery from then until his death, earning the title of the nestor of the faculty. Besides fellowships in the N. Y. Academy of Medicine, and American Surgical Association, he was a member of the International Society of Surgery. He was made president of the Academy in 1895, of the N. Y. State Medical Association in 1898, N. Y. State Medical Society in 1906 and the American Medical Association 1907. New York University conferred on him the degree of LL. D. in 1908. He was a strong man, whose opinions always carried great weight in the numerous institutions for which he was consultant. Few men have passed a life so full of achievement. The city, state and nation owe him a debt of gratitude for his public services.

use is based on empiric results. A few years ago no one heard of it, and now its consumption is enormous. No doubt in a short time we will find contraindications or bad results which will limit its use, but at the present writing it seems to be a permanent and valuable weapon in the fight against intestinal intoxication and its myriad fatal sequelae. Containing no oxygen it is not saponified or emulsified, and produces no fatty acids to irritate as in the case of olive or cotton seed oil, once so popular. It contains no stimulants to the muscle, and has no irritative or osmotic action to increase the fluid content of the feces. It acts purely as a lubricant supplementing the normal mucus and thus materially assists the peristaltic action of the muscles. All of it may be recovered from the feces. The dose varies from a teaspoonful to two tablespoonfuls, from one to three times a day, preferably a half hour before meals. It is cumulative in action and the full effect may not be experienced for several days or even two weeks if small doses are taken, and moreover the results may persist for a week or more after ceasing to take it. There is some evidence that by relieving the strain on the intestinal muscles it actually strengthens them; by removing the irritation of hardened feces it restores the normal mucus; by facilitating evacuations it reestablishes the lost habit of regular and periodic movement; by coating the fecal masses it restricts absorption of poisons; and it is not accompanied by pain, colic or straining. It is easy to take, being devoid of taste or odor and of the consistency of glycerine. Many people object to the oiliness and various mixtures have been devised to conceal this characteristic, but a little effort will overcome the objection to the pure oil. It must be freed of all sulphur compounds, acids and fluorescent lighter hydrocarbons, all of which are more or less poisonous. It sometimes escapes from the rectum but the sphincter soon becomes educated.

It has been proved useful in simple stasis, visceroptosis, hemorrhoids, mucous colitis, pregnancy and the exasperating constipation of infancy and childhood. We must be on the lookout, however, for contraindications, for it is a comparatively new remedy and there has not been sufficient time for all its effects to become known.

**The increasing popularity of liquid paraffin as a laxative** is one of the astonishing things in modern therapy. It can scarcely be called a fad or fashion, for its



## SOME REMARKS ON THYROID DEFICIENCY.

BY

DR. E. HERTOGHE,  
Antwerp, Belgium.

The study of the internal secretions is engaging more and more of the attention of medical men. Twenty years of earnest work have brought to light many important facts. Successful therapeutic results have not, however, been obtained as uniformly as expected with some of the internal secretions, notably those of the pituitary and suprarenal glands. Pituitary extract, for instance, has not cured certain diseases known to be the consequence of pituitary deficiency, i. e., acromegalia, and some forms of infantile obesity combined with atrophy or non-development of the sexual organs; adrenalin has failed in the treatment of Addison's disease; finally, ovarian extract has been unable to remove many of the secondary troubles resulting from ovariectomy. Careful study, however, of certain diseases traceable to thyroid deficiency—the mild and severe myxedemas—has led to the attainment of much useful knowledge. Thyroid medication in these cases has been very successful and suggestive. I am sorry to say that many members of our profession are not familiar with these results. Occasionally they have seen a few cases of severe myxedema in hospital wards, but they have failed to give sufficient

attention to the treatment of these diseases. As a consequence many even today do not know how thyroid extract works and why. I shall, therefore, briefly consider certain phases of this important subject.

### Normal Function of the Thyroid Gland.

—Complete knowledge of the physiologic function of the thyroid gland would enable us to recognize at once symptoms of deficiency. Unfortunately, much remains to be determined, but we can take the following as well established facts:

*First.* No cell anywhere in the body can reach morphological perfection without thyroid stimulus. A child born with thyroid atrophy does not grow; give it a few grains of thyroid extract and its growth starts immediately. Stop the medication and again all progress is arrested. This shows the influence of the thyroid on bodily growth.

*Second.* When a cell has done its duty for some time it begins to degenerate, the proteid molecule is reduced and split up, and finally eliminated through the lungs, bowels and kidneys, mainly in the form of urea. When thyroid activity is below normal, the carrying away of the cellular waste matter is slow and incomplete. Mucin, fat and other principles accumulate at various points and give rise to a certain form of edema. This edema is obvious in many cases, but it may also be so slight as to be almost unnoticeable. If the activity of the thyroid varies, this edema may vary in its intensity; nevertheless it is always present to a certain degree. This is what is called myxedematous infiltration. The point to be insisted upon is that this infiltration is the constant lesion of thyroid defi-

ciency. Absolute proof of this is found in the fact that when thyroid extract is given to a patient afflicted with this particular kind of infiltration, he loses in weight, eliminates an increased quantity of urea and continues to do so until all the accumulated waste matter is dissipated, after which he will lose no more, however great the dose he may take.

*Third.* The thyroid has great influence over menstruation, pregnancy and lactation. When the thyroid is normally active menstruation is normal, when weak, menorrhagia sets in; the weaker the thyroid, the greater the loss of blood. Thyroid secretion, therefore, has an inhibitory action on menstruation and keeps it within proper limits. In pregnancy, the thyroid becomes hypertrophied and pours into the blood an unusually large quantity of secretion, thereby suspending menstruation and protecting the fertilized ovum against the harm that would result from menstrual activity. This action of the thyroid should be remembered in cases where chronic abortion has resisted all other forms of medication. After childbirth, the maternal system is suddenly relieved of certain demands and the large amount of thyroid secretion still in store might reasonably cause apprehension. No fear need be entertained, however, for it will be utilized to accelerate uterine involution and promote lactation. Involution promptly takes place when the thyroid is active; the lacteal flow is also stimulated and experiments on animals have shown conclusively that thyroid extract increases the quantity of milk.

**Symptomatology of Thyroid Deficiency.**—Infiltration, the constant result of hypothyroidism, affects every tissue, every organ of the body, without any exception, and from this we may rightfully conclude that the range of its symptoms must be very wide. For instance, infiltration into muscle tissue brings about painful contractions; muscular power is impaired, the patient becomes stiff and sore, and objects to moving because of the muscular pain and discomfort thus produced which are of a rheumatoid character. Connective tissue

is also infiltrated, likewise tendons, aponeuroses and ligaments.

The effect on the nerves is shown by neuralgic and shooting (neuritic) pains. Infiltration of central nervous system in the milder cases produces headache (migraine), dizziness, vertigo and ear noises. In severe cases there is loss of consciousness, defective memory, sudden falls and coma, which is often taken for the uremic state of Bright's disease, albumin being present in the urine. Myxedematous coma is never a condition to be trifled with, for it may and often does end fatally. It is of the utmost importance in any case of coma, therefore, that the nature of the cerebral trouble should be diagnosed.

Infiltration into glandular tissues causes symptoms that are serious and far reaching in effect. The sweat glands cease to act, intestinal secretions are dried up, hepatic activity is much impaired, and the biliary secretion is poured into the blood as a result of compressed canaliculi, causing a special kind of jaundice that is peculiar to thyroid deficiency.

The epidermic and endothelial coverings of the body show early symptoms of thyroid defect. Desquamation of the epidermis is rapid and repair is delayed. The hair falls prematurely, and in mild cases especially, becomes grey at an early age. The nails are striated and brittle. The teeth are in a most deplorable condition, the gums becoming red and inflamed, and forming polypoid projections between the teeth. The loss of the outer third of the eyebrows is often striking. Eczema, psoriasis, seborrhea and alopecia find a good soil in the skin of these patients. When eczema or psoriasis respond to thyroid extract it is evident that the successful result is achieved by the reabsorption of specific infiltration.

The endothelial lining of various cavities is also liable to infiltration. Endothelial debris made up of cells and infiltrated material is cast off into the gall-bladder and often leads to the formation of calculi. The epithelial lining of the urinary-bladder is prematurely cast off, inducing a marked irritability of the bladder; thyroid deficiency therefore is often encountered with enuresis nocturna, pollakiuria, painful micturition and kindred conditions.

Bones become brittle, break easily, and are slow to unite when the thyroid is inactive. This is why thyroid extract is often so helpful in promoting the repair of fractures. Fracture patients in whom this treatment is successful rarely fail to show other symptoms of thyroid deficiency.

Cartilaginous tissues are also early affected; they heal slowly and are the last to get free of pain. A pathognomonic symptom in the joints is the crackling sensation closely resembling that produced by pressing snow. Often the patient hears and feels crepitation of the cervical vertebrae.

In structures as complex as those entering into the cardio-respiratory system, the effects of infiltration are pronounced; myxedematous infiltration of cardiac muscle—slow, weak pulse—infiltration of nerve ganglia at the base—painful contractions (false angina pectoris) with or without shooting pains in the left arm—paresis of the thoracic muscles and diaphragm—swelling of the mucous lining of the whole pulmonary system, etc., etc. All these tend to produce more or less dyspnea, sometimes to an incredible degree. In mild myxedema this dyspnea is often intermittent, and is then frequently mistaken for asthma. Cases of asthma that have been reported cured by thyroid extract have undoubtedly been cases of intermittent dyspnea caused by thyroid distress and infiltration.

In the gastrointestinal tract, the resulting paresis of the muscular walls of the hollow viscera and lessened intestinal secretion usually bring on obstinate constipation, fermentation and meteorism. In time microbes migrate through the walls and reach the peritoneum and even the kidneys. The peritoneum in its efforts to resist invasion, covers itself with false membranes; the latter grow into bands, causing adhesions and kinks in all portions of the intestinal tract.

Many are the normal duties of the thyroid gland—growth, general development of the body, and the maintenance of nutrition throughout the whole organism. It can readily be seen what a strain sexual excess will impose on it. It must be remembered, moreover, that all infectious diseases of early life—measles, whooping cough, scarlet fever—draw largely on its vitality. Acute rheumatism of the joints has a well known depressing influence on the gland, and in many cases of severe myxedema one may glean the history of an attack of acute articular rheumatism.

But that is not all. All the great causes of pathological disturbance, tuberculosis, syphilis, alcoholism, paludism, chronic starvation, consanguinity, etc., aim their first blow at the thyroid. Actual myxedema may not be the immediate result for the individual who contracts syphilis, tuberculosis, etc., although he may give more or less evidence of mild hypothyroidism, but the thyroid insult rarely if ever fails to be severely resented in the offspring. Many cretins have hereditary syphilis and hereditary tuberculosis, but the thing that keeps them from growing is their thyroid deficiency. Iodine, mercury, tuberculin cannot cure them, but thyroid extract can. Ten years ago our medical activities would

have been limited to a simple diagnosis, but now we can help these children and restore them to growth and health. This shows how useful is our knowledge of hypothyroidism and its far reaching influence.

Again, we are inheritors of an immense number of generations. Our blood is a mixture of good and bad qualities—bad qualities that have been left there by our forefathers while they struggled against innumerable causes of bodily distress.

**Types of Myxedema.**—Severe forms of myxedema are rare and their aspect is so striking that they cannot easily escape the trained physician, but mild forms of thyroid deficiency are very common, and frequently escape detection. Very often thyroid weakness is hereditary, and if one person in a family has it, for instance the mother, the children will all suffer more or less from it. Tonsillitis chronica, hypertrophy of tonsils and adenoid vegetation of the pharynx are very often found in such children, and it is now known that these afflictions are very frequently due to hypothyroidism.

Mild forms of thyroid deficiency are not synonymous with cretinism—some of these patients are very intelligent, good tempered and lead a fairly active social life. It is to these mild forms that I wish to draw the attention of our medical men, for if they acquaint themselves with these mild types they will be able to overcome successfully a great number of pathological conditions.

I would advise any medical man who wishes to gain experience in that direction to follow up and carefully study some case of severe myxedema. Myxedema is a wonderful disease. Under treatment it subsides as quickly or as slowly as is desired. The medical attendant can carefully study the different symptoms as they progressively decline and disappear. Then to all appearances the patient is cured, but if he

leaves off taking the thyroid extract, he will promptly relapse into his previous condition—and the first symptoms which appear are those typical of mild deficiency.

For instance, the first symptom in some patients is the alteration of the voice, which is slightly muffled; then comes the infiltration of the mucous membrane of the nostrils. The patient speaks through the nose, and is promptly advised by his friends to take thyroid extract, for they have learned that this will remove the symptom. In other cases, liver symptoms appear first; the patient says he cannot bend over—this is the result of congestion or infiltration of the liver and is pathognomonic in mild myxedema.

Thyroid extract in doubtful cases will often prove a veritable touchstone. If under its use a patient loses in weight, excretes more urea, while his pains and other symptoms disappear, the diagnosis is certain.

**Thyroid Instability.**—Leopold-Levy and Rothschild have set forth what they call thyroid instability. Patients suffering from hypothyroidism would, after a small dose of thyroid extract, turn sharp to hyperthyroidism. I will now explain why such eminent authors have been led into making this erroneous statement. Dr. John Rogers at the meeting of the Greater New York Medical Association, on Monday, April 20, 1914, at which I also had the honor of presenting an address, drew especial attention to their theory. I was glad he did so, for it is well to bring these questions to an issue. When thyroid extract is given to a hypothyroid patient, infiltrated material promptly begins to be absorbed. If this takes place slowly, all is well; but if too quickly, this sudden taking away of infiltrated material will produce pains and other symptoms, more acute even than those previous to treatment. Thus cardiac pains and palpitation are often increased after a few but

too strong doses of thyroid extract; so is built up the picture of hyperthyroidism. In fact it is nothing else but too rapid absorption. Intense and sudden oxydation of the accumulated cellular waste matter may also help to produce this condition. Rise of body temperature is observed nearly always under intensive treatment and this pyrexia has been considered as hyperthyroidism, but this is a mistake.

**Treatment of Thyroid Deficiency.**—At the present moment the only practical way of treating mild and severe myxedema is thyroid feeding—I always use tabloids of thyroid substance obtained from Burroughs and Wellcome Co., these tabloids containing five grains each of active principle. I give to adults from ten to fifteen grains a day, i. e., two to three tabloids. At the same time I take care to give some dependable laxative every day. This will rapidly eliminate such toxins as are thrown into the intestines, the same way as urea is excreted through the kidneys.

Alcohol, wine, beer and sugar should be strictly avoided. Cold baths are bad, for they take away a good deal of warmth without affording the slightest benefit. Hot baths, on the contrary, are useful and should be taken freely.

Some forms of hypothyroid migraines will be helped along very well with thyroid extract and a very small dose of arsenic.

Enuresis nocturna can be treated best with thyroid extract associated with a small dose of potassium iodid and potassium bromid. Iodine, bromine and arsenic are normally present in the healthy thyroid.

Long before thyroid feeding was recognized as successful, grafting of the thyroid gland from animals and even human beings had been attempted. Dr. William Seaman Bainbridge some fourteen years ago grafted portions of the thyroid gland into the transverse mesocolon, also in the neighborhood

of the suprarenal gland and in the vicinity of the terminus of the internal mammary artery. He tells me that immediate relief was obtained in some cases, but after a while the grafts were absorbed.

From what I have said about hypothyroid infiltration in sexual organs, one may readily come to the conclusion that thyroid feeding should be very useful and effective in many cases of menorrhagia and habitual abortion. Indeed, menorrhagia, migraine, vertigo, constipation and constant chilliness are in women the most striking features of mild myxedema.

I acquainted Dr. Bainbridge with these facts when he was in Antwerp. Being a gynecologist as well as a surgeon, he said he would make a careful study of hypothyroid menorrhagia. I was very glad he was able to announce before the Academy that he is now convinced of the value of thyroid feeding in these conditions. He has already cured a number of cases with thyroid extract to the astonishment of those who had previously curetted them without relieving the menorrhagia in the slightest degree.

Much more might be said about thyroid secretion, indeed volumes can be written on the subject. My friend, Dr. Sajous of Philadelphia, recognizes its importance, but even his great work on the internal secretions has not exhausted the subject.

In conclusion I wish to emphasize the absolute necessity of medical men being well acquainted with thyroid deficiency and its symptoms. In many obscure cases realization of its possible influence will put us on the right track. The day is coming when we will interrogate the thyroid equation (hypo or hyper) in all our patients, with the same fidelity that we inquire today into their previous history as regards tuberculosis, syphilis and alcoholism.



## THE INTERNAL SECRETIONS AND THEIR LIMITATIONS.<sup>1</sup>

BY

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There are features of our methods of investigation which, analyzed even by laymen, would evoke not only surprise but merited criticism. A laboratory worker will perform an experiment or a series of them and, on the few more or less solid facts gleaned therefrom, will erect a theory. This theory may be faulty and fit with none of the data garnered from other directions; the experimenter himself may be untrained technically and scientifically; but it matters not; the man has performed experiments; hence his conclusions are entitled to consideration and are heralded far and wide. A vast aggregate of data furnished by a host of men working on such a plan cannot but lead to confusion and delay in reaching sound knowledge on any question. This applies particularly to the work being done on the ductless glands. Let us compare this plan with that of an investigator who, less pretentious as to his own technical abilities (on every branch of experimental knowledge if you please), bases his conclusion on a broad survey of the scientific field of normal and morbid biology, that is to say, embryology, zool-

ogy, cytology, physiology, anatomy, histology, chemistry, clinical medicine, pathology, pharmacology, etc., and who selects only those experiments, clinical observations, etc., hundreds perhaps, by men of special competence in those branches, to arrive at a conclusion. Will not this man, whose work is coordinated and systematic, who insists on perfect accord of *all* his conclusions, those on one ductless gland fitting perfectly with those on all other glands, be more likely to approximate the truth? While the first man will base his conclusion on say ten personal experiments, the second man will base his on say five hundred experiments by experts. Does this in itself not suggest greater precision on any question—as far as available knowledge will permit?

The latter plan is the one I adopted many years ago when my work on the INTERNAL SECRETIONS was projected. No one today, endowed with the least degree of fairness, can deny that steadily as the experimental work on the ductless glands has progressed, my views have in many respects been confirmed. This must serve as my apology for the introduction in the following remarks, of my own deductions.

The literature on the internal secretions nowadays is so confusing owing to the total lack of coordination in the work carried on that it is difficult to obtain any clear idea of the functions of any ductless gland. It has seemed to me therefore that a sum-

<sup>1</sup>Read before the University of Pennsylvania Chapter of the Alpha Mu Pi Omega Medical Fraternity, Philadelphia, March 14th, 1914.

many of these functions might prove interesting to you. You may be laboring, however, under the impression that giving special attention to these organs, I am a rabid advocate of the idea, introduced by Brown-Séquard, that all organs produce an internal secretion. I would ask to be considered in precisely the opposite light, i. e., as most conservative. Very few glands, from my viewpoint, produce an internal secretion in the sense that their product has a *specific* influence on the functions of all other organs as true hormones, i. e., on the body at large. To endow with an internal secretion so many structures as is at present done, undoubtedly serves greatly to obscure the whole problem and to hamper progress. It is because of this that the title of this paper refers to the limitations of the subject. Indeed, I will begin with the series of organs which do not appear to me, judging from the evidence available, to produce internal secretions.

### Organs Having No Internal Secretion.

**Pituitary Body.**—This structure not many years ago was classed among the vestigial organs but its functional importance asserted itself when Marie showed its intimate causal relationship with the disease he termed acromegaly. Evidently it had some powerful influence over general nutrition. Gigantism was also associated with it, lesions of the pituitary being discernible in practically every instance. How does it exercise its influence?

The prevailing view at the present time is that it produces an internal secretion. It is composed of two parts (1) a glandular or spongy portion composing the anterior lobe and (2) a nervous portion, the posterior lobe, which includes a layer, the pars intermedia that separates it from, but

is in juxtaposition with, the anterior lobe. It is this pars intermedia which is said to produce the secretion that extracts of the posterior lobe, or the active material obtained from it, are supposed to represent. Now the weakness of the hypothesis is shown by the fact that the only glandular portion of the organ, the anterior lobe, whose structure would suggest a secreting gland, produces extracts which are inert, as shown by Howell, while the structure which produces active extracts is a nervous organ presenting no secretory characteristics, and connected directly with the brain. The colloid masses supposed by Herring, Cushing and others to be secretory products, are present in the inert anterior lobe but not in the active posterior lobe according to Grünbaum. Indeed, there is ground for the belief, to which Halsted has recently added testimony, that the colloid, found in large quantities in relatively inactive thyroids, is an inert substance and not a secretion at all; its presence in the inert anterior lobe being additional proof of this fact. On the whole, we can certainly state with Swale Vincent that "it is extremely difficult to imagine how such a structure can be regarded as a secreting gland."

I have long held that the pituitary body is not a secreting gland. It serves, from my viewpoint, to coordinate two important though correlated functions: The first of these is to protect the body against disease and poisoning. The first part of the mechanism is the anterior lobe, a contractile organ through which the circulating blood passes, and in which the contents of the blood cells, white and red, is in part evacuated. The cellular fluids and the plasma form a substance, the colloid, which passes through a vacuole between the anterior lobe and the pars intermedia

of the posterior lobe and out through the lymphatics, their elimination being assisted by periodical contractions of the organ similar to those of the spleen in which blood cells are also broken up. On its way out, however, the colloid residuum comes into contact with the pars intermedia which contains nerve cells resembling certain cells found in the olfactory area of the nasal cavities. I regard this portion of the pars intermedia as an important sensory organ having for its purpose to test the blood for any poison it may contain, just as the nasal olfactory area can test and detect unpleasant and often harmful emanations in the air. The sensory organ in the pars intermedia I regard as the homologue of the osphradium or test organ found in lower forms, which has for its purpose to protect them by testing their respiratory fluid, sea water, represented in us by our blood. In the higher forms, including man, the protective impulses are transmitted from the sensory or test organ in the pars intermedia by way of the adjoining nerve cells in the posterior or neural lobe, up the infundibulum, along the base of the brain, the medulla oblongata and cord and thence through the sympathetic to the thyroid apparatus, adrenals and kidneys. When a poison or toxin capable of exciting the test-organ (for some poisons depress it) occurs in the blood, therefore, the thyroid and adrenals increase their output so as to increase the antitoxic power of the blood at large, while the kidneys are stimulated to excrete with abnormal vigor the poison itself or the end-products into which it has been converted.

Have we any evidence of such a function in man? I might quote in this connection the observations of a believer in the secretion theory—an antagonist therefore—in reference to the after-effects of

surgical removal of the pituitary body for tumor of this organ. "I wish to call attention," writes this observer, J. A. Flexner of Louisville, "to the extreme susceptibility of these patients to morphine and to autointoxication, especially of purin origin." In referring to a personal fatal case, he states that "one twenty-fourth of a grain of heroin kept her narcotized for over a day" and he concludes that "this sudden and unexpected end was due to stopping of her glandular feedings and to the severe autointoxication which resulted from her careless dietary." Considered from my viewpoint, the woman by losing her pituitary, had lost her power to oppose actively certain poisons, even those derived from foods.

Yet, the death is partly attributed to the absence of glandular feedings, meaning thereby the internal use of pituitary gland. There is no doubt of this, but as noted by many physiologists, Howell, Schäfer and others, extracts of the posterior pituitary and the gland itself cause effects both general and toxic, which are identical with those of adrenal extracts. That in the posterior lobe the adrenal principle is present, though in close organic combination with other substances, is shown by the fact that when one applies the chromaffin test a marked positive reaction is obtained (Wiesel). This shows that the organ forms part of the chromaffin system, that is to say, of that system composed of adrenal tissue and sympathetic ganglia and nerves. The giving of pituitary gland to the patient helped her, therefore, because she received through it a part of the aid she would have obtained had her pituitary and its test organ been present to stimulate her adrenals.

This introduces the second function I attribute to the pituitary body, that is to

say, to its neural lobe. Its connection with the chromaffin system stamps it as a sympathetic ganglion. I have long held that it is the chief ganglion of the sympathetic and chromaffin system, and that its nervous elements are highly differentiated cells, the axons of which follow the path outlined above, to become connected with the sympathetic system at large. But it will take many years, doubtless, even if my views prove to be sound, to develop fully the functions of the pituitary as I interpret them. It brings in features which themselves have not as yet been sufficiently fathomed to permit fundamental conclusions necessary to the mechanism as a whole. Yet, when we realize that not many decades have elapsed since sympathetic fibers were regarded as connective tissue fibers, there is some hope that even the test organ will have its day.

**Pineal.**—This organ has had a varied career. Descartes thought it contained the soul; its connection with the pineal eye of Reptilia and other low vertebrates caused it to be classed with the vestigial organs, a convenient waste basket for structures whose functions are unknown. Like the pituitary body, also classed formerly as a "vestigial organ," it has been raised to the rank of a useful organ. It contains neuroglia and what are regarded as secretory cells. Certain of its follicles contain what is termed "brain-sand," also found in the choroid plexus and elsewhere, but devoid, as far as we know, of physiological importance. As to the functions of the pineal, it is thought in some way, perhaps through a secretion, to control growth in the young. Destructive tumors of the pineal in children under their seventh year may cause them to become abnormally tall and prematurely developed as to their genital organs, hair growth, and ossification. Obesity is oc-

casionally observed in these cases. Yet it does not seem to influence metabolism, judging from the results of removal. Notwithstanding this, the feeding of pineal gland to young animals by Dana, Berkeley, Goddard and Cornell caused them to outgrow the controls rapidly in activity, size, intelligence and resistance to intercurrent disease, while in children it appeared to benefit certain cases of retarded development though not cases of total idiocy and gross physical defect.

From my viewpoint, although future labors may modify this attitude, the pineal does not possess the attributes of a secreting organ, the effects obtained with its extracts being accounted for through the fact that the large granular nuclei it contains in abundance are very rich in nucleins. It appears to me more of the nature of a nervous organ capable of influencing directly or indirectly the peripheral circulation and particularly that of certain organs, the genitalia and skin especially, during development.

**Thymus.**—There is no ground, in my opinion, for the belief that this organ is the source of an internal secretion. Its structure resembles greatly that of a lymph gland, the tonsils, etc., and is rich in leucocytes and large concentric corpuscles, known as Hassall bodies, the special functions of which have not been established. Other structures resembling the latter and known as myoid cells, owing to the resemblance of their elements to rudimentary muscle fibers, are also to be found. Although the organ is necessary to development, disappearing only in most instances at about the sixteenth year, its removal in the young does not necessarily prove fatal. While in certain animals, the guinea pig, for example, the operation does not influence development, in others, puppies or

young dogs, for instance, it causes anemia and leucopenia, with deficient nutrition and very marked cardiac dilatation with death within a year. The series of events as observed by Klose and Vogt, includes a period of obesity which lasts two or three months and one of idiocy lasting until death. The bones are then found to be atrophic, dwarf-like and deficient in undissolved calcium. The fact that removal of the thymus in hens causes them to lay eggs without shells, emphasizes the influence of the thymus upon calcium metabolism.

The stage of idiocy observed in dogs after removal of the organ recalls the autopsies of 89 children recorded by Katz and Bourneville. Of these 25 had been mentally weak or epileptic; without exception these cases showed absence of the thymus, while the organ was normal in all other children.

These data, coupled with the fact that the thymus contains a nucleo-proteid which is very rich in phosphorus (3.5 per cent.); that these and nucleins are the most prominent constituents of the protoplasm of all cells, and as stated by Oliver and Schäfer, "the most probable antecedents of the internal secretions," led me to conclude in 1903, that "the thymus is the main organ upon which the osseous, cerebro-spinal and nervous systems depend for their phosphorus during their development." It is a temporary storehouse, in other words, from which the tissue building leucocytes gather the elements out of which the nuclei of tissue cells are built. Nothing has been published since that has weakened my opinion that the thymus does not produce a true internal secretion.

**Liver.**—The prevailing view is, justly in my opinion, that the glycogenic function of the liver does not belong to the cate-

gory of an internal secretion. Urea has been termed by Biedl a "negative internal secretion," owing to its relative harmlessness, and because it is believed to excite the kidneys. When, however, we trace urea to its origin, and realize that it is an end product of toxic substances, protein wastes, ammonia compounds, etc., subjected to the antitoxic action of the liver, we can hardly consider it otherwise than as an excretory product.

### Organs Having An Autonomous Internal Secretion.

The second series of organs to which I will refer are those which, from my viewpoint, do not produce an internal secretion possessed of a specific action throughout the body, but are intended only to influence those structures which form part of the mechanism to which the secreting organ belongs—the ovary, for instance, in its relations to the genital apparatus. This class might be termed *autonomous* internal secretions, to identify them from those which affect the body at large, the true hormones, as defined by Starling, who wrote recently: "By the term 'hormone' I understand any substance normally produced in the cells of some part of the body, and carried by the blood-stream to distant parts, which it affects for the good of the organism as a whole. The hormones are thus the chemical means of correlation of the activities of different parts of the body."

**Testes.**—Although the testes are thought to produce an internal secretion, orchitic extracts are known to owe their beneficial effects to nucleo-albumins, substances that are rich in phosphorus. The fact that beneficial effects have also been noted in obesity, eczema, psoriasis and other disorders in which either thyroid or

adrenal gland is of distinct value, suggests that both of these substances are present in testicular preparations, besides the phosphorus-laden nuclear products to which their main therapeutic value is ascribed.

The presence of the adrenal principle reveals itself when the identity of the one testicular product which has given the best therapeutic results is sought. This product, known as spermin—isolated by Poehl—has given better results than the ordinary orchitic preparations, and in the same disorders. It is probably produced by adrenal rests in the testes similar to those in the kidney. When considered in the light of the functions I attribute to the adrenal secretion, spermin resembles it very closely. It is an oxidizing body which acts catalytically, it gives the guaiac and Florence's hemin test, thus showing that it is a constituent of hemoglobin; it is unaltered by boiling, and presents other characteristics of the adrenal principle. That it is an ubiquitous constituent of the organism at large is further shown by the fact that it is found in the blood of females as well as in that of males. Brown-Séquard, in fact, found testicular extracts as efficient therapeutically in women as in men.

My own belief is that the testes do not produce a true internal secretion, but that they restore to the blood substances which they borrow therefrom to build up, with the product of their adrenal rests, their autonomous secretion. All these substances contribute also to the formation, in appropriate structures, of semen, both fluid and spermatozoa, the latter, as is well known, being rich in nucleins. The substances returned to the body at large include, therefore, besides what portion of the autonomous internal secretion the organs of the genital system have not utilized,

the unused reserve of materials created for the process of copulation which Nature, never wasteful, turns to good account, particularly during growth, i. e., during the presexual period of life. This view, which is here advanced for the first time, seems to me to elucidate many obscure questions. The debility, languor, mental torpor and deficient growth noted in boys who indulge in excessive venery or masturbation is accounted for, while it explains the effects of castration. As is well known, this operation, when performed before the age of puberty, prevents the growth of hair, arrests that of the thorax, pelvis and larynx, the voice remaining childish—all phenomena which are precisely the converse of those caused by an excess of adrenal secretion as we shall see—the prostate and vesiculae seminales failing to develop. Briefly, and even though the long bones grow inordinately though imperfectly, owing to disturbances in calcium metabolism, these subjects remain infantile, owing to the total deprivation of the testicular product which during development should have been entirely utilized by the organism at large.

**Ovaries and Corpora Lutea.**—There is considerable analogy between the characteristic effects of castration in the male and those following removal of the ovaries in young females. What remains of the genital organs, the uterus, vagina and vulva, and also the breasts retain their infantile type. In developed females there is a tendency to atrophy of the same structures and to obesity (also observed in men after castration), while menstruation ceases. The influence of the ovaries on metabolism also corresponds with that of the testicles. The dictum of Brown-Séquard—to whose remarkable physical improvement under the

influence of testicular extract I can bear witness—that this agent is more efficient than ovarian extract in the treatment of women, suggests a kinship between these two organic substances. This is emphasized when the pharmacological action of ovarian extract is considered. Precisely as does spermin, it awakens all the characteristic effects of epinephrin; it raises the blood pressure, slows the heart and raises arterial tension, while in castrated animals, it enhances oxidation. That it influences general metabolism is shown by the fact that ovarian extract increases the excretion of urea and phosphoric acid. As stated by Mulon (1904) in fact, the corpus luteum presents all the morphological characteristics of an aggregate of chromaffin cells to which class the cells of the adrenal medulla also belong.

Here again, it seems to me, we are not dealing with a true internal secretion, as regards a fixed function in the organism at large. As far as available evidence permits us to judge, the ovary produces a secretion which sustains metabolism and nutrition of the *sexual apparatus*, of which the ovaries, the secreting organs, themselves form part, and also the menstrual function. During the intervals—only from my viewpoint, please remember—the unused excess is absorbed into the general circulation not as a special secretion or hormone, but as a part of the general asset in adrenal and thyroid secretions, nucleins, etc., with which the functions of the general organism are usually carried on. When the ovaries are removed or when menopause occurs, the organism is deprived of two of the structures which contribute to the general welfare certain substances, among which the adrenalin-like principle and possibly nucleins may perhaps with

some degree of certainty be mentioned. I need but recall the effect of oophorectomy and the menopause to emphasize the phenomena that attend the loss of the ovarian function.

After ovulation which occurs during menstruation, the corpus luteum is formed. This organ is also credited with an internal secretion; but the latter acts also within the reproductive system, its purpose being, according to prevailing views, to augment markedly the nutrition of the uterus and assist in the fixation of the embryo. It seems also to insure the development of the mammary glands after conception has occurred and to continue to do so during the earlier months of pregnancy. But as the mammary glands form part of the reproductive system, this action does not warrant the inclusion of the ovary among the true ductless glands.

**Kidneys.**—The belief that the kidneys are the source of an internal secretion does not rest on solid data. The renal veins do not seem to contain any sort of active agent. The renal extracts produce a rise of blood pressure so suggestive of that of the adrenal secretion that various authors have called attention to it. Bingel and Strauss note besides that "the action of rennin, like that of adrenalin, is exerted in the muscles of the peripheral vessels." Like adrenalin, it produces dilatation of the pupil. These effects are readily explained, however, by the fact that the renal tissues contain adrenal rests, those islets of adrenal tissue from which renal hypernephroma is well known to develop. On the whole, it is possible that these adrenal rests are themselves the source of an adrenal secretion—in organic combination perhaps—and that this secretion may serve to sustain metabolism in the gland itself; but the ex-

istence of a true renal internal secretion of value to the organism at large, is extremely doubtful.

### Organs Which Produce An Internal Secretion.

We have now reviewed those organs which to me, at least, appear to produce no internal secretion, and those which produce an autonomous internal secretion specific only to the organs concerned with a single function. I shall now refer to those structures which undoubtedly produce an internal secretion or hormone capable of influencing the entire organism. These are now so familiar to everyone, however, that but little time need be devoted to them.

**Thyroid.**—But fifteen years ago, about all that could be said confidently of the thyroid gland was that it yielded a secretion which subserved a useful purpose in the body and that the effects observed after removal of the organ were probably due to loss of this function. It had been suggested that the gland also destroyed waste products but the evidence was deemed insufficient (Schäfer, 1898). Today, through the labors of many investigators we have learned not only that the thyroid and parathyroids deeply influence general metabolism and the process of growth, but that they take an active part in defending the body against infections and other toxemias. As Vincent expresses it, "the extreme liability of thyroidectomized animals to various infective conditions is strong evidence in support of the view." This connection of the thyroid with the general process of immunity in contradistinction from a specific action of wastes, I had pointed out, in 1903, before, I believe, any other writer, both metabolism and the protective function being carried on in conjunction

with the secretion of the adrenals. Later, in 1907, I submitted evidence which had led me to conclude that the thyroid and parathyroid secretions constituted the substance which Wright had termed opsonin, pointing out, however, that it sensitized not only bacteria, toxins, etc., but also tissue elements, wastes, fats, etc., to facilitate catabolism—a function in which also ferment, as more recently held by Abderhalden, took part. All the more salient features of my conclusions were subsequently sustained experimentally by others. A functional connection between the thyroid and the adrenals was found actually to exist by Kraus and Friedenthal, Kostlivy and Hoskins; a direct connection between the thyroid and the production of opsonins has been established by Fassin, Marbé and others.

Summarizing the functions of the thyroid and parathyroids, it may now safely be said that their secretions are essential to the metabolism and development of the body, while taking part in the processes which protect it against infections and intoxications.

**Adrenals.**—As is well known, the adrenal secretion, represented by its active principle epinephrin, raises the blood pressure and increases the power of the cardiac contractions, while slowing the heart, as shown by Oliver and Schäfer in 1894. A couple of years earlier Abelous and Langlois had urged that the secretion of the adrenals destroyed certain products of muscular metabolism. It has been established also that the adrenal secretion sustains the tone of the sympathetic system, and through it, the cardiac and vascular muscles and circulation. Through this action it governs the vascular supply of all vegetative organs, that is to say, those concerned with growth and nutrition. Moreover, as

more recently shown, it governs the sugar content of the blood, thus influencing carbohydrate metabolism, so important to muscular activity. These functions may be said to have received general acceptance.

As to the views which are still *sub judice*, I may recall that beginning with 1903, I submitted that the adrenals carried on functions of greater importance than those just mentioned. By pointing out that the adrenal secretion was the key to tissue respiration, the previously unidentified "oxidation ferment" of Schmiedeberg, Jaquet and others, the manner in which it caused vascular contraction and thereby regulated the blood supplied to the various organs was explained, each organ being studied in turn. The glycogenic function of the liver was also gone over, and the relations between the adrenal secretion, glycogen and the muscular tissue I held at the time differ little from the views since advanced. In addition to these functions, I urged that the adrenals cooperate with the thyroid secretion and other substances to destroy not merely, as believed by Abelous and Langlois, toxic products of muscular metabolism, but also toxins and poisons of all kinds that are capable of acting as antigen, the adrenal secretion itself being an antibody. These views still await development and final experimental proof, but there is no doubt in my mind that the adrenal secretion will be proven to take an active part in oxidation and general metabolism. For the time being, however, we can only assert that it sustains the tone of the cardio-vascular system, and perhaps of the skeletal muscles, and that it influences carbohydrate metabolism.

**Stomach.**—The secretion of gastric juice of psychic origin, that is to say, produced by the sight of luscious food in man, of meat by a hungry dog, etc., and

also that caused by the show meal, is totally prevented by division of both vagi. The influence of these nerves is further shown by the fact that when the peripheral cut end of one of these vagi is stimulated, gastric juice is secreted. While emphasizing the importance of the nervous mechanism of the stomach in the process, it is evidently not its only resource, for it has been shown that when the stomach has been wholly disconnected from the nervous system in an animal, its functions are not materially impaired. This is due to the fact that the mucous membrane of the stomach contains an internal secretion which in turn excites the gastric mucous membrane to secrete. The internal secretion referred to is not, however, obtainable from the fundus; it is specific to the pylorus.

Most authors state that this secretion is not a ferment because it is not destroyed by boiling, but from my viewpoint, this conclusion is not warranted. There is an oxidizing ferment in the gastric juice which I have termed adrenoxidase which is not destroyed by boiling a certain length of time. Be this as it may, the fact remains that we are justified in stating that the pylorus of the stomach produces an internal secretion or gastric hormone which, carried through the blood to the gastric glands, excites them and causes them to secrete gastric juice.

**Intestine.**—Claude Bernard showed long ago that the passage of food into the duodenum provoked a flow of pancreatic juice into the intestine, but this was first ascribed to a nervous reflex. Popieliski and Wertheimer and LePage discovered, however, that this occurred, when all nerves were cut, upon introducing acid into the small intestine almost anywhere excepting within a couple of feet of its

termination. Bayliss and Starling then ascertained that the acid did not directly influence the pancreas through the intestinal mucous membrane, but that it caused the latter to secrete a substance which, on being carried through the blood to the pancreas, caused the latter to secrete. The substance secreted by the intestinal mucosa proved to be an internal secretion which they termed "secretin." Since then secretin has been obtained from parts of the intestine other than the duodenum and from the stomach.

Although the organs of the digestive system, insofar as the gastric and intestinal hormones are concerned, might be included among the autonomous internal secretions owing to their apparent functional restriction to the stomach and intestines, there is some ground for the belief that even they will eventually be shown to participate in the general functions of the body, as I urged in 1907. This is emphasized by the recent labors of Abderhalden.

**Pancreas.**—Removal of the pancreas in animals gives rise to diabetes. We should expect that ligation of the Wirsung's duct would produce the same effect since it is through it that the pancreatic secretion reaches the intestine. Yet ligation of the duct is not followed by the disease. It is evident, therefore, that it is through some other factor which is suppressed by removal of the organ that it is caused. What is this factor? The bulk of evidence indicates that, as first pointed out by Lépine in 1889, an internal secretion is produced by the pancreas in addition to that which finds its way into the intestine through Wirsung's duct, and that it is the absence of this internal secretion which in the operated animals causes diabetes.

The source of the pancreatic internal secretion is still a mooted point, but the

preponderating view is that the islets of Langerhans—structures which vary in number according to the degree of nutrition to which the body is subjected, inanition, for example, causing them to increase greatly in number—produce it, and moreover, that they sustain carbohydrate metabolism. Hence inhibition of the functions of these islets, through sclerosis, hyaline degeneration, etc., whether the rest of the pancreas be involved or not as shown by a large number of autopsies, gives rise to diabetes precisely as is the case when the organ is removed.

How does the pancreas sustain carbohydrate metabolism? Does it influence the formation of glycogen or its conversion into glucose; or again, does it influence the metabolism of sugar in the tissues? If we restrict ourselves to inhibition of the pancreatic function as a cause of diabetes, a hopeless confusion soon occurs. Indeed, there exists a diabetes due to the opposite condition, i. e., excessive activity of the islets of Langerhans, for we know that adrenalin, thyroid gland, pituitary gland and splenic extract, administered in suitable quantities, and also pregnancy, in which the ductless glands are overactive, all cause glycosuria. It is reasonable to suppose, therefore, that various ductless glands influence the islets through their hormones or secretions, and that it is because they sustain carbohydrate metabolism, that, in excess, they produce glycosuria. This led me to suggest long ago, that we should divide our cases of diabetes into two classes, the *asthenic* cases, constituting the majority, those in which the pancreas was functionally deficient, either through local lesions or through paucity of the agencies, hormones, etc., which activate the pancreatic cells; and the *sthenic* cases, those in which, either through an excessive pro-

duction of these hormones as in infectious diseases, excessive irritability, emotional stresses, local inflammation, etc., the pancreas was overactive. Be this as it may, the fact remains that the participation of various ductless glands in carbohydrate metabolism is now generally recognized. When, therefore, we speak of the pancreas as sustaining carbohydrate metabolism, we must in all likelihood consider the organ as one only of the structures participating in the process.

It may prove of advantage to call attention of those of you who may wish to do laboratory work in this connection to what, from my viewpoint, is an experimental error which is retarding progress by suggesting false theories. Certain experimenters have reported that adrenalin could inhibit the functions of the pancreas, but the error lies in the fact that they used doses above the proportion of epinephrin ever present in the blood, and, therefore, produced sufficient contraction of the arterioles to the pancreas to reduce greatly the arterial blood supplied to this organ. As function in any organ is dependent upon the proportion of arterial blood it receives, they erroneously concluded that the adrenalin could inhibit the production of pancreatic secretion.

The manner in which the pancreatic internal secretion is influenced by other ductless glands in the production of glycosuria—diabetes being ascribed to pancreatic lesions—has remained obscure. In 1903-1907, I offered an explanation which is gaining ground insofar as the experimental work on the subject is concerned. This explanation was that both the adrenals and thyroid, when overactive, can produce glycosuria by increasing, through their secretions, oxidation and metabolism in the pancreas, which they reach through the blood. The

pancreas being thus caused to produce an excess of amylopsin, which in turn acts on the hepatic glycogen, sugar is formed beyond the needs of the tissues at large and the surplus of sugar is eliminated with the urine. This is the *sthenic* form previously referred to. In the *asthenic* form, the adrenals and thyroid are insufficient, and metabolism in the pancreas being correspondingly impaired, alimentary glycosuria occurs precisely as it does after removal of, or degenerative lesions in, the pancreas. The glycosuria of infectious diseases, from this viewpoint, would be due to excessive oxidation, incident upon the febrile process, in the pancreas, in addition perhaps to that of the tissue glucose in the body at large.

**Leucocytes.**—Another function of the pancreas, suggested by myself in 1903-1907 (see pp. 668 to 745, Vol. I in the first four editions, and pp. 885 to 907, Vol. II, in the first six editions of "INTERNAL SECRETIONS AND THE PRINCIPLES OF MEDICINE") was that the pancreatic ferments, through the intermediary of certain leucocytes, took part in the nutritional functions of tissue cells. The more recent labors of Abderhalden indicate that he has reached a similar conclusion insofar as the participation of leucocytic ferments in cellular metabolism is concerned. His labors have received prominence recently, especially through his pregnancy test. Abderhalden holds that each cell, including the leucocytes, absorbs nutritive substances, submits them to digestion by means of enzymes it contains and uses the end products as material to replace its own materials as fast as they are being used up. Even though the cells of the different organs differ in structure according to their functions, they are all supplied with their nutritive pabula in the same way. As Abderhalden

has done since, I also attributed to ferments, both in the tissues and in the blood, the autoprotective phenomena that took place therein, and that are brought into activity when certain poisons, toxins, etc., occur in the blood.

### The Internal Secretions in Therapeutics.

The subdivisions of the organs reviewed into inactive, autonomously active, and active glands, may serve to elucidate the therapeutic action of either division of these organs. The specificity of the cells constituting an organ (as differentiated from that of the cells of any other organ) suggests that when it is used therapeutically, we should obtain its specific *general* effects only when using *true* ductless glands, the thyroid or adrenals, for instance. In the case of the autonomous glands, the specific effects would affect only the organs of the system, that of reproduction for instance, under the influence of the autonomous gland of that system. The action of this autonomous secretion on the body at large, though due to by-effects, would be of major importance, however, in that it would be necessary to the physiological dynamism of all cells by contributing substances normally utilized in the physiological upkeep of all tissues. As regards the glands deprived of a true internal secretion, their action would be that of their chemical constituents, those of the posterior pituitary for example. The nucleins of the thymus, however, would contribute to the actual physiological needs of the body up to puberty, disappearance of the organ coinciding with completed development. All this coincides with the teachings of clinical experience and seems to raise the whole subject out of the field of empiricism.

There is a vast opportunity for fruitful development in this direction—a bewilder-

ing one indeed in its possibilities. And this may be said of the entire subject of the ductless glands. When we know all their relations with metabolism and with the auto-defensive resources of the body, a great stride will have been made in our strife against disease.

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## THE BIO-CHEMICAL PROBLEMS PRESENTED BY THE INTERNAL SECRECTIONS.<sup>1</sup>

BY

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It is within easy reach of memory of most of the present generation that attention has been directly called to the baneful effect of perverted secretions of the ductless glands. Sajous did an amount of work which has been poorly appreciated by the American profession when he published his two volume compendium, "The Internal Secretions and the Principles of Medicine" (1908), less than six years ago. In these volumes he summarized at perhaps unnecessary length, but at tremendous expenditure of time and study, the facts then available, and gave us therein an example of literary research work that made it memorable in the archives of American medical literature. That such an encyclopedia of the subject as Sajous' should be followed in four or five short years by the less bulky but remarkably comprehensive works of Biedl and Falta (both emanating almost synchronously from the Vienna school) is an index as to the amount of at-

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<sup>1</sup>This is undoubtedly one of the last articles written by Dr. Park. It was prepared especially for AMERICAN MEDICINE just before his death.

tention the hormones are now receiving and the importance attached to their properties.

It is probably not too much to say then that the internal secretions constitute at present the most important bio-chemical topic engaging our attention.

The methods for their study combine their independent laboratory and experimental investigation, and the clinical phases of their disturbed activity. Each of these is subject to error or misinterpretation, especially the latter, partly because of the intrinsic difficulty but largely because of their clinical interrelations. Careful chemical and physiological studies may be made of each, but the extent to which they are interdependent, or especially the degree to which one may substitute or vicariate for another, offers apparently the greatest perplexity, while decision must apparently be deferred for a long time, or at least until much more accurate assignment of duties to each can be made.

As between pituitary, the thyroid, the thymus, the adrenals and the genital glands, we are still in grave doubt as to just which function or rôle is dominated by each. Regarding the parathyroids we are apparently more certain, while the rôle of the pancreas seems fairly well assigned. Even though the thymus is doomed to a relatively early disappearance, in the great majority of individuals, we do not invariably find that its persistence proves pathologic, nor its too early subsidence evidencing a duty unfulfilled.

The lesser ductless bodies, like the carotid, the coccygeal and the scattered chromaffin-tissue aggregations, doubtless have a function, of which sight is lost in the greater magnitude and importance of the others.

Again the influence on the development of the osseous skeleton which is produced

by both pituitary and thymic secretion can scarcely as yet be differentiated, nor can the excessive production of fat be ascribed always to one rather than to another of these bodies. So too with regard to overgrowth of hair, or its absence, as well as of other appurtenances of the skin.

Those features which constitute well developed eunuchism are more closely assignable, but when we deal with mental (possibly even moral) defects, and with family or even tribal or racial degenerations, we rest under limitations and boundaries which none can as yet pass.

What we perhaps most need then is an accurate combination of clinical observation and post-mortem or anatomic-pathologic study, and this will require both much time and favoring opportunity. An accurate balance as between apparent cause and effect must be struck in every case, to permit its becoming of real value in this study. It is now comparatively easy to say that, in a given case, the internal secretions are at fault, but to decide just which hormones are culpable is not, as yet, possible in more than a small proportion.

Here then is where we now most need light, accurate record and painstaking autopsy, each of which is beset with difficulty often insuperable. The parents of a defective child are too often incapable of furnishing a case history of value, as well as sentimentally and vehemently opposed to careful anatomic study. Yet without these how are we to make any rapid progress?

Better would it be now for the profession, in the writer's opinion, if students of the subject—(and for that matter we ought all to become such), would cease from all literary effort save collecting and collating FACTS, would familiarize themselves with the already enormous bibliography and literature of the subject—all this for a

period of a few years—and then assign to some committee or commission, or possibly to some unusually equipped individual, the duty of digesting and of presenting anew the total material thus accumulated.

Could this be accomplished we would then have a collection of actual facts of immense importance (not of so many "facts that aren't so"), which might serve as a guide alike in diagnosis and in therapeutics, and have a practical value far beyond estimate. At present we are called upon to revise our views every few months, while living in an atmosphere of uncertainty—even of bewilderment.

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## RECENT ADVANCES IN THYMUS RESEARCH.<sup>1</sup>

BY

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Within the past few years there has been a distinct renewal of interest in the thymus gland. The older literature bearing especially upon the relation of the thymus to sudden death in infants, and to status lymphaticus, has added comparatively little to our knowledge of the structure and function. Of late, however, there have appeared many important anatomical and experimental studies, which have at least established a firm basis for further research. I shall try to put before you this evening what appear to be the more important results of this awakened interest in a very enigmatical organ.

After many years of controversy, there is at present an approach to general agree-

ment as regards the structure of the gland. It has of course been known for many years that the thymus is developed as a paired entodermal outgrowth from the third bronchial cleft. In a few species the ectoderm shares to a slight extent in the formation of the thymus bud. It is now generally conceded that this epithelium persists throughout the life of the gland, entering into the formation of the reticulum and of the so-called Hassall bodies. But for many years, there has been a vehement debate as to the origin of the small lymphocyte-like thymus cells which in the normal gland make up the bulk of the lobules. At first the lymphocytic nature of these cells was unquestioned, and the controversy hinged upon the question as to whether they arose from transformation of the epithelial cells, or whether they invaded the lobules at an early period of development, and then underwent further multiplication *in situ*. This was the state of the controversy when Stoehr<sup>1</sup> in 1906 announced his belief that the small thymus cells were not lymphocytes at all, but true epithelial cells which only morphologically resembled the small lymphocytes of the blood and lymph-glands, but bore no relation to them, genetically or functionally. Stoehr has found adherents in Schridde,<sup>2</sup> Mietens<sup>3</sup> and a few other histologists, but the renewed research, which his radical views called forth, has swung the balance of opinion back to the old idea that the small thymus cells are in reality lymphocytes which at an early stage immigrate into the epithelial lobules from the surrounding connective tissue and there undergo further proliferation. The studies of Hammar<sup>4</sup> and especially the beautiful work of Maximow<sup>5</sup> and his pupils on all classes of vertebrates, have served to confirm this view.

<sup>1</sup>Paper read at the November (1913) Meeting of the Eastern Medical Society, New York City.

The question is not merely of histological interest, but fundamentally important if we are ever to determine the precise role of the different elements of the gland in regard to its function. I have tried by cultivating thymus and lymph-gland *in vitro* to determine whether there were biological differences between the small thymus cells and the lymphoid cells of the lymph-glands.<sup>6</sup> Without going into detail, I may say that their behavior as regards motility, staining capacity, or rather incapacity, for further proliferation *in vitro* were identical. I believe that we may at last come to a definite conclusion as regards the essential structure of the thymus; namely, that it is composed of two distinctly different kinds of tissue, an epithelial and a lymphoid. This, of course, complicates all the problems bearing upon the function of the gland as a whole. We cannot separate these diverse elements artificially, and it must not be forgotten that all the results of extirpation, feeding or transplantation do not take into account this complexity of structure.

Another matter in which at last a general agreement has been reached is that of the normal life history of the organ. Thanks especially to the studies of Hammar,<sup>7</sup> we know definitely that the thymus increases in size and weight up to the time of puberty, then to undergo an abrupt, but incomplete involution. This holds true, not only for man, but for every species of vertebrate that has been carefully investigated. Even in the cartilaginous fishes, the period of maximum development coincides with the advent of sexual maturity.<sup>8</sup> This fact and the table of normal weights which Hammar, Von Sury<sup>9</sup> and others have compiled, disposes at once of a large volume of case reports in which the thymus is described as persistent or enlarged, although

in truth its presence was to have been expected and its weight may have been below the normal for the age of its subject.

A third definite advance in our knowledge is this. We have learned that the thymus is extremely susceptible to all infections and to all conditions affecting the general nutrition of the body. We know that within a few days in the course of an acute infection the thymus may be reduced to a fifth or sixth of its original weight, and in the more chronic forms of wasting disease, the gland undergoes the most extreme regressive changes. It is primarily the small thymus cells, or as we may now safely call them, the thymus lymphocytes, which exhibit this sensitiveness. Their nuclei become pyknotic, fragment and are in part absorbed, in part taken up by the epithelial elements, so that within a short time, the lobules are largely depleted of lymphoid cells. What this wholesale destruction of small thymus cells signifies, we do not know, nor is our knowledge sufficient even to formulate a plausible theory.

I have skimmed rapidly over this part of my subject because I wished to review more in detail, the recent work bearing upon the function of the gland as a whole. The methods which have been used are those to which we are restricted in our study of the other organs of internal secretion, namely: complete or partial removal and attempts to produce a hypersecretion by feeding or injecting fresh gland or variously prepared extract. This is not the place to discuss the limitations of each of these methods. It must be obvious that in our complete ignorance of the chemical nature of the secretion and the absence of any means of recognizing the specific secretion, were we able to isolate it from the gland, inferences drawn from feeding and injection experiments must be applied with a great deal

of caution. Extirpation promises to give us somewhat more definite information, first as to whether the organ is of vital importance to the individual, and second as to whether its removal is followed by alterations of structure and function in other glands of internal secretion.

It does not seem worth while to review even briefly the older extirpation experiments which began with Restelli<sup>10</sup> in 1843 and were repeated at fitful intervals until 1902, when Basch<sup>11</sup> published his first paper. The older work was not done under aseptic methods, was usually uncontrolled by normal animals of the same litter, and no effort was made to determine whether the removal was complete. Since Basch's first paper, however, similar experiments with positive results have been reported by Hart and Nordmann,<sup>12</sup> by Klose and Vogt,<sup>13</sup> by Ranzi and Tandler,<sup>14</sup> Gebele<sup>15</sup> and Matti<sup>16</sup> in Germany and Austria; by Cozzolino,<sup>17</sup> Tarulli and Lo Monaco<sup>18</sup> and Ugo Soli<sup>19</sup> in Italy, by Lucien and Parisot<sup>20</sup> in France and by Swale Vincent<sup>21</sup> in Canada. In this country, so far as I am aware, no systematic work on the extirpation of the thymus has been published, although Auchincloss and Park, working in Dr. MacCallum's laboratory, performed a long series of thymectomies on guinea-pigs, and I have been operating on white rats for the past year, but have not yet completed my studies.

The literature of this phase of thymus research has therefore grown so large that a detailed review is out of the question. I shall, however, try to give in condensed form the results which have been obtained. A number of workers, amongst them Carbone,<sup>22</sup> Fischl,<sup>23</sup> and Sinnhuber<sup>24</sup> have obtained entirely negative results. All those who have obtained decisive changes following thymectomy, have operated upon very

young animals, and have made special efforts to secure a complete removal of the gland. The capacity of small fragments of thymic tissue to regenerate is said to be very great; and the amount of thymic tissue sufficient to ward off symptoms is apparently small. Extreme degeneration of the gland may be produced by X-rays, and yet the destruction is never sufficient to cause symptoms comparable to those following extirpation. Indeed, Cremieu and Regaud<sup>25</sup> who claim to have practically destroyed the thymus in young cats, noted no constitutional changes.

Of the various animals in which thymectomy has been performed, the dog shows the most striking and characteristic changes. Since I have had no personal experience with extirpation in dogs, I shall follow here the vivid description of Klose,<sup>26</sup> which has been largely confirmed by Matti, and which agrees in many respects with the earlier, but less exhaustive work of Hart and Nordmann and of Basch.

If a puppy be thymectomized before the twentieth day, the weight curve rises normally for the first two or three months, but the general habitus differs strikingly from that of the healthy controls. The muscles are flabby, the animals are pasty and bloated, fatigue easily, sweat rapidly, breathe hard with faint exertion, and become sedentary in their habits. The gait is awkward, and the bones bend under the weight of the body, so that the dogs have a clumsy, squat appearance. The appetite is increased, and the animals eat voraciously and without discrimination.

These features last into the second or third month, and constitute in Klose's phrase, the stadium adipositatis.

From this time on, the weight curve begins to fall, the bodily weakness and especially the weakness of the bones increases.

Growth is arrested, the animals are dwarfed and do not attain sexual maturity. In spite of the loss of weight, the appetite continues extreme. Eventually, the dogs are hardly able to walk, but rest for most of the time sitting on their hind legs. Often they exhibit a coarse tremor, and their galvanic excitability is increased, just as in experimental tetany, but not to the same degree. Mental deterioration sets in, and the dogs no longer recognize their master, and eat all sorts of objects indiscriminately. This illness with periods of improvement, lasts from three to six months, or rarely to the fourteenth month. The dog in this period is subject to intercurrent infections which often end fatally.

This stage of chronic and progressive malnutrition, to which Klose has applied the term "Cachexia thymopriva," ends in the so-called "Coma thymicum." The dog lies semi-comatose, biting aimlessly about him, and dies after another week or two.

The pathological changes, aside from the extreme inanition, are most striking in the bones, although alterations, possibly secondary to the general nutritional disturbance, are described also in the central nervous system. The essential change in the bones appears to be a defective calcification associated with increased resorption; the calcium content in the thymectomized animals being 32-34% of the dried weight, as against 64% in the controls. Delayed callus formation after artificial or spontaneous fractures, first noted by Basch, was confirmed by Matti.

There are still differences of opinion as to the precise qualitative changes produced in the bones following extirpation, and as to how closely they can be identified with true rachitic lesions. The descriptions of Basch, Hart and Nordmann, Klose and Matti differ in some particulars, but the

essential fact that the thymus exercises an important influence upon the proper development of the skeleton, seems to be definitely established, not only for dogs, but for rabbits as well. The development of the teeth has also recently been studied in the series of fifty-four dogs which formed the basis of Klose's paper. The influence of the gland in dentition was indicated by a marked delay in the acquisition of the permanent teeth.

To explain the defective calcification, and some of the other changes following thymectomy, Klose has propounded a theory which is suggestive, though in my belief, insufficiently supported by facts. He points out that the thymus is, of all organs, the richest in nucleins, and hence the most important locus for the synthesis of nucleic acid into nucleinates. With the removal of the gland, nucleic acid, and probably lower acid radicals such as phosphoric acid, circulate free in the body, and lead to an acid intoxication. To this is due the diminished formation and increased resorption of bone and the morphological changes which are found in the central nervous system.

This acid intoxication theory has been sharply attacked by Matti, and until the presence of such an acidosis has been established by precise chemical studies, the theory cannot be seriously entertained. We are in truth in utter ignorance of the chemical cause of the defective calcification; but this holds true also of the skeletal changes which accompany cretinism and hypophysectomy, and of the changes in the teeth produced in rats by the removal of the parathyroids.

There are other theoretical inferences made by Klose, such as the supposed analogy between the stadium adipositatis and the pasty, over-nourished habitus of children

with status lymphaticus, which appear to me to rest upon a very insecure basis of facts. What we have learned from these extirpation experiments is that the thymus, in dogs at least, is not an indifferent organ like a lymph-gland, the loss of which is negligible, and easily compensated for; but an organ essential to the proper development of the skeletal system, and indeed, to the growth of the entire body. Much, however, remains to be learned before we can apply these data to human physiology. I have already pointed out that of the few species of animals in which careful experiments have been performed, only the dog exhibits these extreme changes, and in no other species is thymectomy regularly fatal. Even in dogs, according to Matti, some litters are refractory, showing none of the usual sequels of the operation, and it remains to be proven whether this is due to the presence of accessory thymus tissue, as Matti believes, or to individual or racial variation in susceptibility.

In the case of albino rats, after almost a year's work, I find myself unable to decide whether the arrested development, which in some of my operated litters is very striking, is due wholly to the removal of the gland, or to latent infections or nutritional disturbances which evade analysis. It is not infrequent for one of the control animals to lag far behind its brothers and sisters in weight; and for an operated animal to gain weight in excess of the controls. In a few animals in which this took place, I was able to assure myself by serial sections through the neck organs that the removal had been complete and that no accessory glands were present. Striking qualitative changes in the bones or teeth have not been found in rats.

In rabbits, extirpation at an early age is

followed by a retardation of growth and by changes in the bones, which according to Lucien and Parisot, consist merely in an increased delicacy of structure, but according to Cozzolino, are rather in the nature of rachitic lesions, and comparable to the alterations produced in dogs. The gland appears not to be a vital one in rabbits, and the initial retardation of development is gradually compensated for—just how, is not known. Experiments on guinea pigs have been almost uniformly negative.

We have no direct data bearing upon the effect of complete loss of thymic tissue in human beings. The numerous thymectomies which have recently been performed in children for supposed tracheal compression, have not been followed by alterations in development or growth, the only exception being the case of Koenig<sup>27</sup> in which severe rachitic symptoms followed the operation. The removal of the gland in these operative cases is purposely incomplete. That the thymus in marantic children shows an extreme atrophy has been known for a long time and has led to the suggestions advanced by Nordmann, amongst others, that the nutritional disorder is dependent upon the insufficient function of the gland—in other words a cachexia thymopriva. There is really no evidence in support of this view. The same picture in the thymus may be produced by experimental inanition. Indeed, the experimental data, so far as they go, would indicate that only a complete suppression of function produces recognizable effects, and there are no pathological conditions in human beings which bring about a complete destruction of the thymus.

We cannot, therefore, formulate a clinical picture indicating a hypofunction of the thymus. Is there any evidence, on the

other hand, either experimental or pathological, of the occurrence of an excessive or altered secretion?

If we consider first the experimental observations which have a bearing on this question, we find that they consist in attempts to simulate an excessive secretion by feeding, injection or implantation of homologous or alien tissue. On general grounds, it is not to be expected that such experiments can throw much light upon the normal or even abnormal process of secretion in the thymus. I have pointed out that the thymus is composed of two genetically distinct types of tissue, lymphoid and epithelial. We do not know which of these elements is actively concerned, and it seems probable, indeed, from our histological studies, that there takes place a complex interaction between the two types of cells.

Certainly, then, it is not to be supposed that the periodic injection of variously prepared extracts of the entire gland, including the inert supporting elements, can approximate this subtle chemical mechanism.

The actual facts obtained from experiments of this sort may be briefly summarized. Svehla<sup>28</sup> first showed that aqueous extracts of the gland, injected intravenously, caused a marked fall of blood pressure, and this effect has led a number of writers, including Wiesel<sup>29</sup> and Hart,<sup>30</sup> to assume a functional antagonism between thymus and chromaffin system. But not only is this vasodepressive action common to many organ extracts, but in the case of the thymus, it has been shown by Popper<sup>31</sup> and more recently by Basch,<sup>32</sup> to be due to intravascular clotting and not to occur when coagulation is prevented by hirudin. Other experiments intended to prove the toxicity of an oversecretion of thymus are not convincing. The much quoted experiments of Hart<sup>30</sup> who produced fatal intox-

cation in guinea pigs by the intraperitoneal injection of thymus from a case of sudden death associated with *status lymphaticus*, has not been confirmed by others. I can state from personal experience that cats will tolerate daily intraperitoneal injections of thymus over a long period, without losing weight or showing other symptoms of intoxication.

It has been claimed that if thymus be injected or transplanted into young animals previously deprived of their thymus by extirpation, severe symptoms, often ending in death, are produced. I have recently repeated this experiment in rats, implanting thymus tissue into the peritoneal cavity of the thymectomized animals. So far, I have been unable to detect any symptom of intoxication whatsoever.<sup>1</sup>

The experiments in feeding thymus extract have recently been taken up again by Gudernatsch<sup>33</sup> with interesting results. Gudernatsch fed tadpoles with various organ extracts, most of which had little effect. With thyroid and thymus, however, he produced striking changes which may be summed up in the statement that thyroid feeding arrested growth, but stimulated differentiation, whereas the thymus had the reverse effect of retarding or inhibiting differentiation, but producing tadpoles of abnormally large size.

During the past summer, I was able to observe a somewhat similar effect upon the regeneration of the tail segments of a fresh-water worm, *Lumbricus*. The length of the new formed tails in the thymus treated worms was 20-30% greater than that of the thyroid-fed animals.

<sup>1</sup>One rat, which had been thymectomized, and in which thymus tissue was subsequently implanted into the peritoneal cavity, after 18 days developed stiffness and paresis of the hind legs, and general tremors. Several other rats treated in the same way, failed to develop symptoms.

These experiments have, of course, little bearing upon the question of hypersecretion, but they are in accord with our general conception of the gland as in some way concerned in growth and nutrition.

Certain well-known pathological observations seem to point more directly to the possibility of an excessive or altered function. The hyperplasia of the thymus which is almost regularly found in fatal cases of Basedow's and Addison's disease, in acromegaly and in the so-called status-thymico-lymphaticus in adults can only mean that the thymus in these conditions functionates excessively, or at least, exerts its function at a time of life when it should normally be inactive.

Beyond this general inference, all is uncertainty. To attribute to an intoxication from altered or excessive secretion, the sudden death in cases of status lymphaticus, seems to me quite unwarranted by any proved facts at our command. The role of the enlarged thymus in Basedow's has given rise of late to a good deal of discussion, and Hart, amongst others has shifted the emphasis from thyroid to thymus, claiming that the latter gland is responsible at least for the cardiac and vasomotor symptoms, and for the lymphocytosis. Several surgeons (Garré<sup>34</sup> and others), have removed the thymus in cases of exophthalmic goitre, with alleged benefit, but it is too soon to judge of the value of this procedure. Certainly, there is very little experimental basis for considering the thymus as the central organ of attack in this disease, and the relation of the two glands has been and is still, the subject of much controversy and little positive knowledge.

Let me briefly summarize this rather discouraging array of negative conclusions.

Positive progress has been made in our knowledge of the normal and abnormal structure of the gland. The thymus is a lympho-epithelial organ, persistent throughout life, but reaching its maximum development at the time of puberty. It is therefore an organ functionally most active during the growth period. In accord with this is the experimentally established fact that in some species of animals complete removal arrests growth and especially the proper development of the skeletal system. In dogs, removal at an early age ultimately results in death; in rabbits and probably in guinea pigs the effects are transient. We have no data as to the effect of removal or partial suppression of function in human beings. There is no experimental work which gives us a clue as to the effect of an excessive or perverted secretion. Pathological and clinical observations do, however, indicate both an abnormal persistence of function, and an excessive function. We are not yet justified in assigning to the thymus a definite role in the causation of any known disease.

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## REVIEW OF SOME RECENT WORK BEARING ON THE FUNCTIONS OF THE PITUITARY BODY.

BY

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Ever since the important discovery made by P. Marie,<sup>1</sup> in 1886, that the disease known as acromegaly, characterized by enlargement of certain parts of the skeleton, general cachexia, etc., is associated with pathological changes in the pituitary body, this gland has had a special interest both for the clinician and the physiologist.

Histologically and embryologically it is a composite organ consisting essentially of

two parts—the pituitary gland proper, derived from an epithelial outgrowth known as Rathke's pouch, and the true hypophysis cerebri, nervous in origin, growing downwards from the wall of the third ventricle. When fully developed the so-called pituitary body is described as consisting of two lobes—a posterior and an anterior. The posterior lobe includes the pars nervosa or true hypophysis, and the pars intermedia, the latter derived from the epithelial or glandular portion and forming a close fitting investment for the nervous portion. The anterior lobe, which almost completely surrounds the posterior, is epithelial in origin and has the structure of a true gland of internal secretion.

According to the views of Herring,<sup>2</sup> the pituitary body yields both an external and an internal secretion. The former is produced by the cells of the pars intermedia and, after passing through the pars nervosa, is discharged into the third ventricle, where it mingles with the cerebro-spinal fluid; the latter is formed in the anterior lobe—possibly also in the pars intermedia—and finds its way directly into the blood vessels which are sinusoidal in character.

After the discovery of Marie the next important contribution to our knowledge of the functions of this gland was that of Oliver and Schäfer,<sup>3</sup> in 1894. These observers found that intravenous injection of aqueous or saline extracts of the entire organ produces a marked rise in the general blood pressure, not so great as in the case of adrenalin but more prolonged. This action is peripheral and is due mainly to constriction of the arterioles.

Howell<sup>4</sup> was able to show that this pressor effect is obtained only from extracts of the posterior lobe and that the anterior lobe is physiologically inactive. It is also known that the heart is stimulated to beat

more powerfully but more slowly even after division of the vagi, and that unlike the active principle of the adrenal glands the pressor substance of the pituitary acts directly on the musculature of the heart and blood vessels and not through the autonomic nervous system. It appears to have a stimulating effect on non-striped muscle generally, as shown by the experiments of Dale,<sup>5</sup> Cramer,<sup>6</sup> von Frankl-Hochwart and Fröhlich,<sup>7</sup> Blair Bell,<sup>8</sup> and others, and on this account it is being used extensively in obstetric practice in cases of post-partum hemorrhage and to promote uterine contraction.

The diuretic action of posterior lobe extract was first demonstrated by Magnus and Schäfer,<sup>9</sup> in 1906, and later by Schäfer and Herring.<sup>10</sup> These investigators observed that while the general effect of intravenous injection on the systemic circulation was vaso-constriction, the local effect on the renal vessels was usually dilatation as indicated by plethysmographic records, and that this was accompanied by an increased secretion of urine. That the diuresis was not due to the increased flow of blood through the kidney, or not entirely due to this, was shown by the fact that in several experiments where no renal vasodilatation was observed there was still a distinct increase in the flow of urine, indicating a direct action on the secretory epithelium of the kidney.

In 1910, Ott and Scott<sup>11</sup> found that "infundibulin (the active principle of the posterior part of the hypophysis)," injected intravenously, produced a marked increase in the rate of secretion of the mammary gland in the goat.

A few months later Schäfer and Mackenzie,<sup>12</sup> experimenting with lactating cats and dogs, were able to confirm the findings of Ott and Scott. In anesthetised animals

they arranged to have the milk-flow recorded graphically on a kymograph by means of a drop-recorder, either by making a superficial incision in the mammary gland and leading the milk away by a few strands of lamp wick or by tying a cannula into the nipple. The extract was made from dried posterior lobe of the ox pituitary, with Ringer's solution, and was injected into a superficial vein slowly and in small quantities (not more than 5 c.c. at a time). As a result, in about 20 seconds after injection, the mammary gland responded by a greatly increased flow of milk. The effect passed off after three or four minutes and a repeat dose given at an interval of half-an-hour or less produced a much smaller quantity of milk than the first dose. In both these respects—short duration of flow and diminished response after each injection—the effect differs from that of the same extract on urinary secretion.

They also found that the galactogogue substance is not present in the pars anterior and that it cannot be extracted from the posterior lobe with absolute alcohol although it is not destroyed by contact with absolute alcohol, nor by repeated boiling, nor by prolonged preservation in a dried state. They obtained a marked effect from dried posterior lobe which had been kept for some years in a stoppered bottle.

Mackenzie,<sup>13</sup> continuing the work alone, found that the galactogogue substance is present in the pituitary body not only of lactating females but also of non-lactating females and of males. It is not even specific to mammals since it is present in the pituitary of birds and possibly of other oviparous vertebrates. Herring found it in the skate.

In two samples of cat's milk secreted under the influence of the extract the percentage of fat was much increased while

there was no change in the sugar content, but Mackenzie is not inclined to lay much stress on this observation since Ott and Scott reported no increase in the fat of goat's milk after injection of infundibulin where the conditions were more favorable for a correct estimation of fat.

Mackenzie made one experiment on a hospital patient (human subject) who was suffering from unilateral mammary abscess, the healthy breast being observed. On the morning after admission to the wards the breast was emptied by a suction apparatus, 60 c.c. of milk being obtained. A dose of infundibular extract was then administered subcutaneously and an hour later the breast was again aspirated when the yield was rather more than 100 c.c. Although not conclusive, as far as it went, this experiment supported the results obtained from the cat.

In order to determine, from the commercial point of view, whether the amount of milk per diem, or its quality, is influenced by the extracts employed by Schäfer and Mackenzie, Gavin<sup>14</sup> experimented on dairy cows and published his results in July, 1912. The posterior lobe was administered by mouth, and also by subcutaneous and intravenous injection, but no change in the quantity yielded nor in its quality was observed. He concludes "that under conditions of ordinary farm practice no commercial benefit arises from the administration to dairy cows of these extracts," (He used also extract of corpus luteum) "whether given by mouth, by subcutaneous injection or by intravenous injection" and "that intravenous injection of pituitary extract may be followed by an increased collection of milk in the lower portions of the udder, but that in spite of this no alteration in the total quantity per diem or in the quality of the milk occurs."

In October of the same year Schäfer<sup>15</sup> published the results of an experiment, carried out for him by Dr. Sumpter, on a young married lady, twenty-eight years of age, who was nursing her second baby and at five months was beginning to yield less milk than the baby required. Four injections into the triceps humeri were made at intervals of two or three days, the dose varying from 1 c.c. to 1.5 c.c. of pituitary extract, each c.c. representing 0.2 grams of fresh posterior lobe. The results, given in the patient's own words were as follows: "The first injection produced no apparent effect; on each of the three subsequent occasions there was an immediate effect; I could feel the milk coming in with a tingling sensation. But so far as I can judge no lasting effect. I judge this from the fact that though there was more milk than usual for the baby for the meal following the injection, I had to wait a long time before I could feed him again, and in spite of the injections my milk is gradually getting less in amount. It had, however, very decidedly begun to diminish before the injections were started."

That there was an actual increase following the administration of the extract apart from any subjective feeling, is shown in one of the experiments where the milk was pumped from the breast during five minutes a quarter of an hour before injection and again during five minutes half an hour after injection. In the first five minute period 9 c.c. of milk was yielded and in the second 32 c.c.

The quality of the milk in this case was not tested.

The next to investigate this matter was Hammond,<sup>16</sup> working with Dr. F. H. A. Marshall of Cambridge, England. He used goats, three in number, in various known stages of lactation. The usual dose was

1 c.c. of the extract of the posterior pituitary lobe injected subcutaneously, and a careful analysis of the milk yielded before and after injection, was made. His conclusion is that "the injection of the extract has an immediate action on the milk secretion, but the effect soon passes off so that the daily yield is only slightly raised. The milk obtained as a result of injection is normal in composition except for a higher percentage of fat; in the following milkings, however, there is a drop in the percentage of fat although that of the other constituents remains normal." This paper was published in the August number of the *Quarterly Journal of Experimental Physiology*, 1913.

Believing that the relatively small doses employed by Gavin in the cow (He used little more for the cow than Mackenzie did for the cat) might possibly explain his negative results, Mr. R. L. Hill, a graduate student working in this laboratory, and the writer undertook an investigation, on the goat, in order to determine whether the total quantity of milk in the twenty-four hours could be increased by giving larger quantites of the substance. At that time we had not read Hammond's paper.

The results of our observations will be published in detail in number 1, vol. VIII of the *Quarterly Journal of Experimental Physiology* just about to appear, but here it may be stated that when the milking is made about fifteen minutes after injection both the yield and the percentage of fat are always increased. On one occasion the fat content rose to 18 per cent. As in the case of Hamomnd's animals there is a corresponding diminution in the quantity at the next milking so that for the twenty-four hour period there is little or no increase; we did not find, however, a sudden fall in the fat content as he reports, but

rather a slow decline, extending over two or three days. As our experiments were made late in the lactation period when the gland was drying up, it will be necessary to repeat them, of course, under different conditions.

Our doses were considerably larger than those given by Hammond and most of them were administered intravenously whereas he used the subcutaneous or intramuscular method. If it is really the case that with a particular dose the fat content continues above normal for some days after each injection the observation may prove to be of some economic importance. All that we can say at the present time, however, is that it was found to do so in one animal, late in the lactation period.<sup>1</sup>

The bearing of these observations on the normal functions of the pituitary body is interesting but it must be remembered that great caution has to be exercised in interpreting the results obtained from the intravenous injection of any glandular extract. Although several active substances may be present in the pituitary extract it does not necessarily follow that these same substances are being continuously or intermittently produced by the gland, in the living body, and passed into the circulation. In the case, for example, of the galactogogue substance present in the extract of birds' pituitary we know that this cannot be so; if it is a normal secretion in the bird it must have some function other than that of acting as a stimulus to mammary gland tissue since this is entirely absent.

On the other hand, with regard to the diuretic substance found in the extract of the posterior lobe, there is some evidence that this is produced in the gland since

<sup>1</sup>We are able to say from a recent experiment that the extract has the same effect on the cow as on the goat; there is an increase in the yield of milk and also in its fat content.

mechanical or electrical irritation of it in the living subject frequently results in an increased secretion of urine. Also the polyuria not commonly found in cases of acromegaly, which is frequently associated with the presence of an adenomatous tumor in the anterior lobe, is easily explained by supposing that the mechanical pressure may irritate the posterior lobe and so produce increased secretion and diuresis.

Before we can be certain, however, that these substances are formed in the living organ we must find indications of their presence in the blood or lymph as it leaves the gland, or in the cerebro-spinal fluid. Cushing and Goetsch,<sup>17</sup> indeed, claim that the active principles are to be found in the cerebro-spinal fluid, for when this is slightly concentrated and injected intravenously, effects similar to those which follow injection of the extract are obtained. This has been questioned, however, by Carlson and Martin.<sup>18</sup>

Then again comes the question as to whether each of the actions known to be produced by intravenous injection of the extract is due to a distinct and separate substance or are they all brought about by one and the same substance. Although an answer cannot be given with certainty, there is a good deal of evidence in favor of the first view. A pressor substance was separated from the extract by Schäfer and he also believes that the diuresis is produced by one substance and the dilatation of the renal vessels by another. Cramer's observations tend to show that the substance which acts on the pupil is not identical with that which excites renal activity. Recent work by Herring<sup>19</sup> would seem to point to the fact that the mammary hormone also is a distinct substance, not identical with any of the other active principles of the posterior lobe, since he finds that

the pituitary extract of the skate, while it has no effect on the blood pressure, kidney volume or urinary secretion, does excite the mammary gland.

It is generally agreed that extracts prepared from the anterior lobe are inactive, as was first pointed out by Howell. On the other hand, according to the experiments of Paulesco,<sup>20</sup> Crowe, Cushing and Homans<sup>21</sup> and others, this is the division of the organ which is really essential to life.

Removal of the pituitary body, in the living anesthetised animal, is a formidable operation and was first successfully accomplished by Paulesco in Europe and by Cushing in this country. According to these observers, total hypophysectomy, in the dog, is followed by the death of the animal in three or four days. It recovers from the operation and remains well for one or two days and then begins to show symptoms of apituitarism, characterised by subnormal temperature, loss of appetite, rapid emaciation, unsteadiness of gait, fall of blood pressure, slowing of the pulse and respiration, diarrhea frequently, and finally death. The same symptoms follow removal of the pars anterior alone and develops just as rapidly as when the entire gland is taken away. Loss of the posterior lobe alone does not appear to have any disturbing effects unless it be excessive sexual activity which manifests itself in some of animals operated on.

Partial removal of the anterior lobe gives rise to symptoms somewhat resembling those present in Fröhlich's disease in the human subject. These are regarded as manifestations of hypopituitarism. The most striking features are adiposity and sexual infantilism, with a tendency to subnormal temperature, mental dulness and apathy.

A study of the rôle of the hypophysis in growth has a bearing on the conditions of acromegaly and gigantism. It is generally believed that here it is the anterior lobe that is involved. Feeding experiments have not given uniform results in the hands of different observers but several claim that administration of anterior lobe along with the food increases the rate of growth.

According to the view originally put forward by Marie, diminished pituitary function is the primary cause of acromegaly, but at the present time just the opposite view is held by most authorities. This condition is very often associated with the presence of adenomata involving the pars anterior, or with hypertrophy, and presumably increased activity, of the glandular tissue. As in the case of the thyroid apparatus so in the pituitary there are specific and characteristic symptoms associated with the hyperactivity and also with the hypoactivity of the gland, and these differ according to the age at which the disturbance of the pituitary function manifests itself. Speaking generally, if hyperpituitarism occurs early in life, before the epiphyses have united, gigantism or gigantism results, if later, acromegaly.

Similarly with regard to hypopituitarism, the type differs according to the age at which the condition first appears. In all types adiposity is a common feature together with genital hypoplasia, mental dulness and frequently somnolence, and if the disease begins in childhood or adolescence, there is also skeletal under-development and stunting.

In all these conditions it is believed to be the anterior lobe which is primarily affected.

Recently, in a series of hibernating animals (woodchucks), Cushing and Goetsch<sup>22</sup> find that during the dormant

period the pituitary not only diminishes in size but undergoes extreme histological changes, chiefly evident in the cells of the pars anterior, which completely lose their characteristic differential reactions to acid and basic stains. At the end of the dormant period the gland enlarges and the cells regain their characteristic staining reactions. They remark that, on the basis of this observation, hibernation may be ascribed to a periodic physiological inactivity, possibly of the entire ductless gland series, but more especially of the pituitary body. The train of symptoms, coupled with retardation of tissue metabolism and with inactivity of the reproductive glands, which accompanies experimental states of hypophyseal deficiency and which also characterizes clinical states of hyperpituitarism, is comparable with those observed in hibernation, viz.: lowering of body temperature, slowing of pulse and respiration, fall in blood pressure, and somnolence, and it was this general resemblance which led them to undertake their investigation.

The relationships which may exist between the pituitary and the other glands of internal secretion are still to a large extent unknown. Attempts have been made, mainly by the Vienna school, to construct schemes of interrelationship of all the ductless glands with each other and also with the autonomic nervous system, but even an outline of these is beyond the scope of this review. In the case of two of the glands, however—the thyroid and the gonads—there is much evidence to show that they are functionally related to the pituitary.

The idea of a vicarious action between the thyroid and hypophysis was first suggested by Rogowitsch.<sup>23</sup> He found that following thyroidectomy, in the rabbit, there was hypertrophy of the pituitary body.

His observations have been confirmed by Degener<sup>24</sup> and many others, and Herring<sup>25</sup> has further showed that there is an increase in the amount of colloid material in the posterior lobe, together with evidence of hyperplasia of the pars intermedia after thyroidectomy. In the sheep, however, Simpson and Hunter<sup>26</sup> failed to find any increase in the iodine content of the pituitary at the end of six months after removal of the thyroid.

The interrelation between the glands of reproduction and the pituitary appears also to be well established. One of the most constant symptoms of hypopituitarism, clinical and experimental, is hypoplasia of the reproductive glands, both ovaries and testes, with suppression of the secondary sexual characters. The converse of this is shown by some experiments of Cushing and Goetsch<sup>27</sup> where they fed dried extract of bovine hypophysis to young rats. They conclude that pituitary extract, and particularly that of the pars anterior, has a markedly stimulating effect upon the growth and development of the reproductive glands in both sexes, as evidenced by histological examination, and that extract of the pars anterior tends to cause early and frequent breeding. Posterior lobe extract has no such effect and does not appear to stimulate sexual development.

With regard to the effect of changes in the functional activity of the ovaries and testes on the pituitary there is some difference of opinion. It is generally agreed that the hypophysis regularly enlarges in pregnancy and returns to its normal size during lactation. By some, castration, both in male and female, is also said to lead to hypertrophy of the pituitary, but this is denied by others. The results appear to differ with the species of animal used and also with the sex. Hatai<sup>28</sup> finds that in the

albino rat removal of the sex glands from the male produces an enlargement of the hypophysis, while in the spayed female the hypophysis is not affected.

In conclusion, it must be admitted that our knowledge of the functions of the pituitary body is still very incomplete, but there are many workers in the field and important facts are being steadily accumulated which are bound to throw light on many points that are still obscure in the physiology of this important organ. In this relation it should be remembered that practically all we know about the pituitary gland has come to us within the last thirty years or since Marie's great discovery in 1886.

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## THE EFFECTS OF GOITRE OPERATIONS UPON MENTALITY.<sup>1</sup>

BY

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**Introductory Remarks.**—A diseased condition of the entire body, characterized by the presence of symptoms due to the absorption of an excessive amount of thyroid secretion, with or without enlargement of the thyroid gland, suggests the diagnosis of the disease commonly known as "exophthalmic goitre," "Grave's disease," or "Basedow's disease." Inasmuch, however, as many of these patients exhibit no prominence of the eyes, the reference to exophthalmos in the naming of the disease is inaccurate and misleading. Needless to say, the attachment to the name of a disease of the name of an individual, however important his observations in this connection may be, is unscientific and unfortunate.

In view of the fact that the exhibition of symptoms due to the introduction of thyroid toxins into the system characterizes the clinical picture in these cases, the term "systemic goitre" appears to me to be a fitting designation for this disorder, which is seemingly of true autotoxic origin. This term will therefore be employed as synony-

mous with hyperthyroidism and dysthyroidism—increased or perverted thyroid secretion affecting the entire body, with local enlargement of the thyroid gland as a matter of secondary importance.

Systemic goitre is characterized by increased frequency of action and palpitation of the heart, protrusion of the eyeballs, tremor, and a number of diseased mental and nutritional disturbances. All these symptoms may be present, or one or more may be absent. Under the term of infantile athyreosis Quincke described certain states of arrested mental development, with trophic disturbances of the teeth, which differ from cretinism by the normal or even hypernormal growth in length, and the later onset of the disease.

The benign hypothyroidism or myxedema fruste, of Hertoghe, is a transition stage between pronounced myxedema and the normal condition. In this observer's opinion there is hardly a symptom or symptom complex which cannot be traced to the incomplete function of the thyroid gland. A long series of neurasthenic and vasomotor disturbances were referred to this organ by Levy and Rothschild. Saenger pointed out the occurrence of abortive forms of myxedema in which cardinal symptoms such as cutaneous changes are absent, and the psychic changes are not well marked.

The mental condition of patients suffering from systemic goitre is hardly ever normal. The neuropathic diathesis is revealed by a number of manifestations. Disturbances of the nervous and psychic equilibrium are not uncommonly among the first signs of the incipient disease. Excessive irritability, excitement, forgetfulness, restlessness and absent-mindedness, are characteristic of practically all cases, the psychic disturbance being outwardly

<sup>1</sup>Read at the Annual Meeting of the Bridgeport (Conn.) Medical Society, December 2, 1913.

betrayed, as a rule, in the facial expression and the behavior of the patients. They are apt to be timid women, easily frightened and ill at ease, restless and fidgety, prone to involuntary movements which express their embarrassment and lack of poise. Their statements may be inaccurate and contradictory, with frequent lapses in memory. The degree of the disturbance varies greatly in individual cases, as well as in the different stages of the same case.

Disturbances of sleep, from restless, interrupted slumber, often with vivid dreams, up to complete insomnia, are among the most distressing symptoms of the disease, and naturally react most unfavorably upon the physical as well as the psychic well-being of the patient. Other cases are characterized by a peculiar drowsiness, and Oppenheim observed some goitre patients who slept so soundly that they could not be aroused. Kocher refers to a case of somnolence in a woman thirty-one years of age who was suffering from the disease.

A specific psychosis of systemic goitre apparently does not exist. Clear-cut mental aberrations, under the definite picture of melancholia, mania, or catatonia, are not so common as transitions into atypical or mild forms of dementia, which have been occasionally noted in the course of the disease. The psychosis is usually persistent, although it has been known to subside while the disease itself remained stationary or even became aggravated.

Oppenheim mentions a patient who suffered from grave systemic goitre, associated with disturbances of speech and a psychosis having the character of toxic delirium. The diagnosis of general paralysis had been rendered by an experienced psychiatrist. Operative treatment of the goitre was recommended by Oppenheim, and led to the cure of the entire affection.

According to the majority of modern investigators, more particularly operating surgeons, headed by Kocher, this disease is due to an increased activity of the thyroid (Moebius) or an abnormal function (Gauthier), or a combination of increased and perverted glandular function. Recently some astonishing results have been secured by Sir Arbuthnot Lane through treating this condition as due to an underlying intestinal stasis. This authority holds that the absorption of effete products from the intestinal tract is the basis of this as well as of many other maladies. Others have interpreted the condition as a dysthyreosis, through iodine poisoning, the organ having lost the capacity of storing the iodine as iodothyronin, in the normal manner (Klose).

A very important part in the production of the mental disturbances noted in patients with systemic goitres, undoubtedly belongs to the exaggeration or perversion of thyroid function. Practically all patients having the disease have an unstable nervous equilibrium, and their psychic condition suffers accordingly. This is not surprising in view of the known fact that the thyroid secretion affects the nutrition of all parts, including the brain. Disturbances on the part of the digestive apparatus have been enumerated among the leading symptoms of the disease, both in regard to their frequency and their pronounced effect upon the duration of the trouble. In certain cases, diarrhea is one of the incipient symptoms, and may be followed by a period of rebellious obstipation, as an expression of intestinal atony.

Although there exist theories in plenty concerning the mutual relations between the thyroid and other glands with an internal secretion, such as the parathyroids and the suprarenals, the available data are

still too unreliable and contradictory to justify a prolonged discussion of these teachings. A number of facts have also been ascertained, without definitely establishing the part played in goitre cases by the thymus, which during the time of its physiological development represents a vital organ of special significance for the nervous system. Hypertrophy of the thymus in these cases is probably a compensatory process, an excess of which may in turn involve dangers for the organism. The mutual relations between the thyroid, the pancreas and the suprarenals, have been explained as being of an inhibitory character between the pancreas and the thyroid, while the relation between the suprarenals and the thyroid has been interpreted as antagonistic by some, and as synergistic by others.

The influence of the thyroid changes upon the psychic condition was investigated by Ramadier and Marchand, who examined the thyroid glands of many deceased insane individuals. Aside from cretinism and myxedema, no causative connection could be established between the demonstrable changes of the thyroid parenchyma and the various forms of mental aberration. This dependence is usually traced simply through the action of thyroid extract upon the patient, whereas the conclusions of the French investigators are based upon their personal observations on all sorts of mental aberrations, such as acute confusional insanity, chronic dementia, mania, melancholia, dementia precox, senile dementia, progressive paralysis, epilepsy, organic brain disease, etc. The glands were weighed and the macroscopical as well as the microscopical findings were carefully noted. Considerable fluctuations in the weight of the organ were apparent, but the same holds good for normal individuals. No connection

could be established between the weight of the thyroid, and the various types and degrees of mental impairment; nor did the gross findings indicate any relation between thyroid change and insanity. The microscopical examination repeatedly showed the existence of circumscribed sclerotic or atrophic foci and of parenchymatous or interstitial inflammations in the thyroid tissue. These changes were found, however, both in mentally normal and mentally unsound individuals, and similar anomalies in the thyroid glands were noted in different varieties of mental disease. Moreover, the changes of the glandular tissue were not expressed by the functional disturbances during life. The investigators suggest, on the basis of their findings, that injurious factors, such as toxins, or other poisons which are capable of affecting the brain and thereby producing a mental disturbance, are capable of attacking the thyroid gland at the same time.

The manifestations of the malady are usually charged to the excessive functional activity of the gland. The onset in most patients is insidious, but it may be acute, especially after violent emotions, and it can usually be shown that a neurasthenic or hysterical stage has preceded the development of the symptoms.

Local goitre or struma, by which is meant an enlargement of the thyroid gland as a whole or of some individual part, without an increase or change of the internal secretion, does not enter into the present consideration.

**Surgical Treatment.**—Through the better understanding of systemic goitre and the improved technic, the surgical treatment of the disease has been so greatly advanced in the last twenty years that after a long period of hesitancy operative intervention is now very widely recommended in these

cases. Surgery has certainly proved superior to internal measures, for, as pointed out by Oppenheim; although there are several useful medical remedies, none can be relied upon. While the outcome of medicinal treatment is extremely problematical, especially in regard to the psychic symptoms, surgical interference upon goitres, provided a sufficient quantity of secreting glandular parenchyma is preserved, almost invariably relieves in whole or in large measure the common emotional disturbances of these patients.

The surgical treatment of systemic goitre, in the form of partial strumectomy, is conceded by Oppenheim to be a legitimate and efficient procedure, which should not be postponed until the terminal stages of the disease, nor be restricted to the gravest cases. The operation was recommended by him in about twenty-five cases, in the course of the last few years, some of these cases concerning patients who were on their way to Kocher and simply desired advice as to the necessity for surgical treatment. Although only a small number could be examined before and also after the operation, it could be ascertained in eleven cases that the curative result was perfect and extended over several years. The persistence of the cure at the end of nearly thirty years after the operation could be established in one instance by Rehn. The most striking and immediate results of operative interference in many cases consists precisely in the improvement of the mental symptoms and the relief of the nervous disturbances.

After operations upon goitres, previously restless patients are often soothed and quieted. Individuals who for a long time have been confused, apathetic and introspective, are aroused to attention concerning their surroundings, again become in-

terested in their work, or ask for some occupation while still in the hospital. Even established nervous diseases of long standing, such as hysteria, epilepsy or chorea, sometimes undergo marked improvement after goitre operations. Unfavorable post-operative conditions which represent an exacerbation of long standing nervous symptoms, in predisposed individuals, cannot of course be charged to the operation itself. Chronic psychic disturbances through thyroid insufficiency, which have been described in the past as an occasional sequel of goitre operations, may be said to occur exclusively in consequence of total extirpation of the gland, a procedure which, needless to state, has now been abandoned, except in malignancy. Partial strumectomy, first performed by Tillaux and Rehn, is at present the procedure of election.

The value of surgery in goitre cases has been especially advocated by Kocher, on the basis of his constantly improved results. His procedure consists in a combination of partial strumectomy with arterial ligature, preceded by a preliminary course of treatment for quieting the nervous system, especially in patients with considerable excitement and acceleration of the pulse. The indications are extended by him so that nearly all patients with systemic goitre are advised to submit to operation, unconditionally so in the incipient or mild cases, while in the graver cases an operation in several sessions may be required. Avoidance of general narcosis, omission of all disinfectants, and careful hemostasis, are insisted upon. The outcome depends upon the amount of goitre tissue which has been removed and the quality of the glandular parenchyma which is left behind.

It has been shown that in consequence of the psychic excitement incident to the operation, the thyroid secretion may be

modified both as to quantity and quality. Such patients have been known to die in collapse while being prepared for the operation. Crile's anoxic association method of preventing shock in these cases has lately been adopted by a number of surgeons. The essence of orange-ether sequence, as recommended by Gwathmey, acts very beneficially. A mixture of ether in olive oil,<sup>1</sup> administered by rectum, has very recently been advocated by Gwathmey, and employed by him in over a hundred general surgical cases. According to his experience this method amply fulfills all conditions of anoxic association, as enunciated by Crile. In the judgment of Berry, simple open-ether anesthesia, with a preliminary small dose of atropin hypodermatically administered, is all that is necessary in the vast majority, the results obtained being fully as good as with any other method.

In this connection it is interesting to note that depressing emotions or severe fright under all circumstances have a very unfavorable effect upon the course of the disease, and may cause a sudden exacerbation of systemic goitre. Acute attacks, later becoming chronic, have been known to develop as the immediate sequel of psychic disturbances. In a case described by Rahel Hirsch, a young, previously healthy girl was attacked by palpitation of the heart, anxiety and insomnia, directly after a psychic shock induced through a visit to the morgue. At the same time her mother noticed a marked prominence of the eyes and a swelling at the neck. The condition developed into a typical case of systemic goitre. Cases have been reported, on the other hand, in which a happy event or a cheerful frame of mind has ushered in a

spontaneous improvement or the subsidence of all symptoms. Peace of mind and rest of body are the primary considerations in the treatment of the disease. Empirically, the rest treatment is still advocated by a number of physicians, although of course it cannot alone remove real pathological changes of the gland. Complete mental and physical rest alone has relieved symptoms. An icebag applied for a half hour once or twice daily in the experience of a number of observers including the writer has proved a real benefit. Some patients have been helped by the topical use of electricity.

Surprisingly prompt effects are often noted after goitre operations, part of the most distressing symptoms disappearing in short order, although a preexisting psychosis may not be markedly benefited. It is not to be expected that the operation, although it removes the determining factor, should also influence the psychic degeneration when it is already well established. In some cases, the relief afforded by the operation is almost instantaneous, improvement manifesting itself within a few hours, while in other cases more or less time, sometimes six months up to an entire year, may elapse before the full curative effect is established.

The permanent results of radical versus conservative treatment, in systemic goitre, were investigated by Baruch, in 1911, upon a material of 164 cases; including 51 operations and 39 cases treated by conservative methods, divided between ninety cases concerning whom later information could be obtained. He personally reexamined 48 of these patients; detailed professional statements were available in six other cases, and the patients' own statements had to be relied upon in six cases. Nine patients died as the immediate result of the operation, but among the 51 survivors, there was not a single subsequent death from this disease.

<sup>1</sup>The ether in oil method I have employed so far myself in two goitre cases and in both the anesthesia was perfectly satisfactory.

As regards the permanent results of conservative treatment, it is a noteworthy fact that not a single patient was cured. The superiority of surgical as compared to internal treatment was illustrated by the results in general, as well as by the effect upon the special symptoms in particular. Among 40 reexamined cases, 15 cases (37.5%) were cured; 14 cases (35.5%) were considerably improved; and 5 cases (12.5%) were moderately improved; there was no improvement in 6 cases (15.0%). Concerning fitness for work, only four among forty cases had to be designated as unable to work; this inability being due in two cases exclusively to grave changes in the eyes. Seven patients were not entirely fit for work. The number of patients conditionally fit for work far surpassed the number of cases described as successful operations or as perfect cures.

A patient who fifteen months previously had been operated upon for systemic goitre, was presented by Englaender, in 1910, before the Vienna Medical Society. Although a few of the symptoms still persisted, such as the tachycardia, this patient had not had a day's illness since resuming his business, two months after the operation.

In order to obtain the remote results of operative interference in systemic goitre, Alomartine and Perrin, in 1911, examined the compiled statistics of many operators, utilizing only those cases which remained under observation for at least three years after the operation. Among 120 patients, 85 (70.8%) were completely cured; and 27 (22.0%) were considerably improved; only 8 (6.6%) were not improved. In the Zurich Clinics, service of Professor Kroenlein, the post-operative psychic condition of the patients was highly satisfactory throughout; several volunteered the state-

ment that they had become changed human beings, since the subsidence of the distressing dyspnea. None showed the dreaded symptoms of tetany or of cachexia strumipriva. In four somewhat idiotic patients, the strumectomy had no effect on the mental condition, either in the sense of improvement or of aggravation.

Psychic symptoms which had existed for five years prior to the operation in a case of systemic goitre with mental confusion, reported by Delmas, in 1910, disappeared within three weeks after hemithyroidectomy. On the basis of his observation of two cases of catatonic dementia precox, Davidenkoff concludes that partial thyroidectomy, or strumectomy, respectively, is entitled to serious consideration in this form of mental disease. Both these operations were followed within the first week by improvement, especially of the motor disturbance.

In pointing out the remarkable advance which has been achieved during the last two decades, in the operative treatment of systemic goitre, Mayo recently (1912) states that the estimated proportion of cures, based on the examination of patients operated upon and from letters and reports, is about 75%. "These patients have been restored to usefulness, resuming former occupations, and are free from nearly all former symptoms."

The vast majority of goitre cases are surgical, and no untoward effect upon the patient's mentality, either temporary or permanent, need be feared. Remote psychic effects are largely due to improper choice of the operative procedure and to faulty surgical technique. The author's experience with these cases and his observation of others have been such as to make him feel that the results can be very efficiently controlled by appropriate preliminary care,

correct technique, judicious selection of the time of operation, and last not least, the proper post-operative attention. The occasional injurious hypersecretion on the part of the thyroid gland, or worse, the escape of a perverted secretion into the tissue, after goitre operations, can be lessened or prevented through a good technique. By carefully guarding against the glandular congestion, before and after the operation, the danger of interventions upon goitres affecting the mentality of the patient is practically eliminated.

At the present writing, the effect of the internal secretions, notably of the thyroid, upon the psychic, can no longer be denied. This organ has been designated as the "emotional gland" (*glande de l'emotion*) by Leopold-Levi and Rothschild. Cases have been placed on record in which there was a distinct parallelism between the systemic goitre and the mental disturbance, the psychosis increasing with the aggravation of the bodily ailment and disappearing through its cure after operation. The patient observed by Delmas suffered from systemic goitre, associated with periodical attacks of fever, convulsions, hallucinations, and a confusional state. Treatment was operative and consisted in the removal of one lobe of the gland. The outcome was not only a cure of the thyroid affection, but the psychosis likewise disappeared three months after the operation. In a similar case described by Horand, Puilliet and Morel, in 1912, the patient developed a psychosis in form of hallucinations, delirium and delusions of grandeur, associated with the rapid growth and degeneration of a goitre. The mental disturbances subsided within a few days after the operative removal of the goitre.

Prior to the performance of any operation, the toxic symptoms of systemic goitre

affect all the important functions of the organism. The mental disturbance associated with this disease is known in Germany as Basedow's psychosis, and as such was recently discussed by Colla (1913). The rudimentary forms are the result of a relatively mild, hyper- or dysthyroidism, which affects circulation and nutrition. Hypertrophy of the gland is hardly noticeable in these cases, exophthalmos is frequently absent, and the disease manifests itself especially by tachycardia, nervousness, tremor, and a peculiar brilliance of the eyes. The psychic disturbances in the fully developed as well as in the mild cases, although extremely variable in degree, are all seemingly due to intoxication, for they are the first to be improved by surgical interference in the form of partial thyroidectomy. The relief of the psychic symptoms is followed by an amelioration of the nutritional disturbances which have been present in the form of vomiting, diarrhea, profuse perspiration, increased urinary toxicity, and rapid loss of weight.

Surgical interference usually cures all early goitre cases, when the heart or kidneys are not seriously involved. Partial thyroidectomies under these conditions are likely to yield a very large percentage of cures, and a permanent improvement of the psychic symptoms may be counted upon with more than a high degree of probability. Systemic goitre usually belongs to the surgeon's domain, with conditional excursions into the field of the internal clinician.

The post-operative course of favorable cases—and under an improved technique, with better understanding of the relations of a persistent thymus, perhaps all cases will become favorable—may be divided into two stages. The first consists in the disappearance of the toxemia, shown by the

immediate and prompt improvement of the psychic disturbances under which the patient has been laboring, and also in a welcome relief of the troublesome tachycardia. The nutrition and general condition are likewise improved, the digestive disturbances subside, and the patient gains in weight. The progressive improvement of the objective symptoms continues in the second stage, and gradually terminates, when all goes well, in the recovery of the patient with a healthy mind in a healthy body.

Interesting experiments have been conducted with reference to homioplastic transplantations in the effort to combat thyroid insufficiency or hypothyroidism. The failures or merely temporary results in these cases are probably due to biochemical differences, as thyroid autotransplantations or reimplantations with vascular sutures have yielded excellent results in the animal experiments of Borst and Endleren, and others. Bircher reported implantations of thyroid gland segments into the cervical connective tissue of cretins. The material was obtained from apparently healthy goitre tissue of youthful individuals, and was implanted into the subcutaneous cellular tissue, where it healed in and for some time could be palpated under the skin of the neck. At the end of seven to twelve weeks, no trace was left of the implanted graft. The psychic condition of the patients had remained unchanged throughout. Three thyroid transplantations in cases of cretinism, or myxedema, respectively, which were performed in the clinics of von Eiselberg, also remained unsuccessful. The highly satisfactory results which at first followed upon Payr's successful transplantation of a piece of the mother's healthy thyroid into the spleen of a six year old female cretin with severe in-

fantile myxedema, were not permanent. Two years later, after the child had grown considerably in length, and had also begun to walk and talk, the somatic improvement progressed at a much slower rate, and the patient's condition actually became aggravated from the psychical point of view.

As pointed out by Kocher, the procedure of Payr is technically difficult and somewhat discouraging. He proposes instead the transplanting of thyroid material into the spongiosa of bone, namely in the metaphysis, the name applied by him to the portion of the bone adjacent to the epiphyseal line. The advantage of this site of transplantation is the highly vascularized but nevertheless resistant character of the tissue, in which a pocket of any desired size or shape may be applied for the imbedding of a piece of thyroid gland in such a way that it exactly fits the space and comes to lie in direct contact with the finest blood vessels, thus favoring the establishment of vascular connections between the natural and the newly inserted tissue. The outcome depends upon the quality of the transplanted gland, which, needless to say, should be as nearly normal as possible. The effects obtained with this procedure in animal experiments are suggestive of its potential results in human beings suffering from thyroid insufficiency.

The writer has transplanted thyroid grafts into little cretins with usually distinct improvement, which, however, proved only temporary. The transplanted tissue was either put deep in the neck, or close to the internal mammary artery in the epigastrium on the peritoneum, or above the kidney in relation to the adrenals. After a time the thyroid graft became atrophic and the improvement in mentality and otherwise ceased.

The thyroid tissue does not seem to re-

main as a functioning organ, although it survives for a short time when transplanted in these various ways. Before discontinuing this line of investigation it seems well worth the while to try a series of cases where direct vascular transplantation is performed. The vessel-to-vessel method, providing for better nutrition of the graft, may prove of permanent value.

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#### MEDICAL HINTS.

For erysipelas, paint with pure carbolic acid and follow with alcohol immediately.

Sponging with a one-in-eighty solution of creosote in alcohol is excellent in the treatment and prevention of bedsores.—*Med. Summary*.

#### ORGANOTHERAPY IN CHILDREN.

BY

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Organotherapy is defined by Reid Hunt as "The utilization for therapeutic purposes of internal secretions, or hormones, in cases where these are deficient." This is the modern conception, for organotherapy does not tend to correct so much the disease of a certain organ, as those conditions of other organs, the activities of which have been impaired by the absence or diminution of an internal secretion. Extracts of organs with internal secretions are not considered.

The study of organotherapy tends to show that many diseases are due to a failure or a perversion of normal chemical processes in which the internal secretions play an important part. As yet we can be guided only by experimental and clinical findings. We must remember that artificial administration of an internal secretion cannot be as accurate as the normal processes that it imitates. The field, however, of a new therapy, is here. In its elaboration and by the detection and isolation of hormones, we may be in a position to control and influence a number of the chief functions of the body.

The classification of organotherapy is a difficult one, for there is a question whether the subject should be studied according to the diseased condition present or to the action of the organotherapeutic agent. To make it more complicated and complex, the actions of some of the hormones are correlated and similar. Practically all observers now group according to the organ from which an extract is derived.

Internal secretions and organotherapy are important from a pediatric point of view, for many of the glands which have internal secretions take part in the general body metabolism, especially in the development and growth.

**The Thyroid.**—The hormone that takes the foremost position is that of the thyroid. The action of thyroid extract in cretinism and myxedema stamps it as a specific for these conditions. It has been proven efficacious in those states of childhood delinquency and backwardness of both the mental and physical types. As has been shown, the degree of inadequacy may range from one extreme to the other; from almost complete imbecility and idiocy to those instances in which just one symptom shows the thyroid insufficiency. I have seen cases in which the only indication for thyroid medication was a delay in reading, writing or speaking; in some children there is a difficulty in enunciation which may or may not be due to an hypertrophied tongue.

Fatigue in children on slight exertion, slight swelling of the eyes, lips and cheeks and pigmentation of the skin are manifestations of thyroid insufficiency and demand thyroid treatment. It is also efficient in those skin conditions which may be the results of hypothyroidism, as eczema, ichthyosis, scleroderma and psoriasis. A coldness of the skin in children should suggest a sluggish circulation due to hypothyroidism.

Cases of enuresis that are not amenable to other treatment should be given thyroid. Leonard Williams and others have had very good results in this condition. Habitual enuresis of long standing is probably due to thyroid insufficiency. The treatment should be given for one week and, if not successful, the thyroid should then be given alternately with calomel, one-tenth of a

grain, three times a day for a month. If results are not obtained in that time, the treatment should be discontinued and other causes than thyroid insufficiency sought.

Chorea and so-called rheumatoid arthritis have responded well to thyroid, due perhaps to the iodine and arsenic contained in the extract.

Enlarged thyroids appear in children in attacks of rheumatic fever and in scarlet fever. I have seen cases of acute thyroiditis with attacks of acute tonsilitis. This shows that in these conditions there is a need of increased thyroid secretion in the system with a resulting hypertrophy of the glands. Were the extract to be given in these cases that show this tendency to enlargement, the danger of the resulting hyperthyroidea, and possibly, later thyroid disease, would be eliminated.

I have used thyroid extract in cases of delinquent children manifesting syphilitic symptoms with good results—does this mean that syphilis has a deleterious effect on the thyroid gland producing hyperthyroidism?

Rickets and delayed bone development due to deficient calcium in the body can be cured by the administration of thyroid which has a large calcium content. The success seen in some cases is remarkable. I remember one case of an infant of fifteen months who had commenced walking at thirteen months but had ceased in three weeks. He presented a typical picture of rachitis with enlarged epiphyses and pot belly. Administration of thyroid enabled him to resume walking in a little over a week. In some cases, however, the treatment must be continued for months before beneficial results are obtained. Infantile convulsions, when due to rickets, are stopped by thyroid.

thyroid, either alone or in conjunction with epinephrin and pituitary gland.

Boltin thinks that epilepsy is due to insufficient functioning of the thyroid and thymus glands. He treated forty cases of epilepsy with rectal injections of fresh thyroid extract. Eleven cases were negative, while eight showed a marked improvement mentally and a complete cessation of the attack very soon after the treatment was begun. The rest showed a decided improvement in six months. This treatment is applicable in those cases of epilepsy which have not progressed too far. The time to treat epilepsy is during infancy and childhood before the cortical degeneration is too far advanced.

The use of thyroid in children is not without danger. Every case must be studied as a separate case, for individual idiosyncrasy is a large factor. The untoward effects may be mental, gastro-intestinal or cardiac. Symptoms of hyperthyroidism shown by rapid pulse, increased nervousness, tremors and profuse sweating should be indications for the withholding of the extract. Great care should be taken in administering it to children with cardiac conditions. Diarrhea, profuse bleeding from the gums, intertrigo and other skin conditions have been produced by it. It should never be given to children of diabetic parents or with diabetic tendency for several cases of fatal diabetes have been reported to have been caused by it.

The methods of administering thyroid are:

(1) Transplantation.

This was the earliest form of thyroid therapy. It is taken advantage of now only in those cases where substitution fails.

(2) Subcutaneous injection of glycerin extracts preserved with phenol. Introduced

by Murray in 1891 and recently revived by Beebe who recommends the use of a thyro globulin.

(3) Administration by the mouth. This is substitution therapy. The use of fresh or cooked glands has been replaced by the use of dried gland or extracts.

The dose depends upon the individual susceptibility. It is best to precede the treatment with calomel, one-tenth of a grain for ten doses, followed by a cathartic. The extract should be started with one-half grain two or three times a day and gradually increased to as much as the patient can stand, never giving more than five grains for the entire day. A good rule is to give it ten days on and ten days off, thus eliminating any possibilities of hyperthyroidism. Its action is enhanced by the use of arsenic, calcium or iodin, but it is more advisable to use the extract alone and then give the other medication, if deemed necessary, in the periods when the gland is not administered.

**The Parathyroid Glands.**—It was formerly thought that removal of the thyroid produced tetany, but it is now accepted that this condition is due to the removal of the parathyroid glands along with the thyroid. These glands secrete a hormone which neutralizes certain toxic substances in the blood; the removal of this neutralizing secretion resulting in tetany. This is generally seen in post-operative cases of thyroidectomy and is cured by the feeding of parathyroid gland. Post-operative tetany is rare in children because of the infrequency of the operation. There are conditions in children, however, which have been shown to be due to an interference with parathyroid functioning. It seems that parathyroid disturbance means calcium disturbance more so than in the case of the thyroid. Some factors of infantile

convulsions are due to calcium disturbance, or rather, a disturbance of calcium metabolism. Administration of parathyroid extract will stop this condition. The action of parathyroid extract is not as specific as that of the thyroid; for in cases of hyperthyroidism, thyroid gland or extract alone will benefit and no other measures or methods will avail; for parathyroid deficiency, however, the administration of the salts of calcium, barium, magnesium or strontium will be as efficacious as the extract of the parathyroid.

This extract has been used with beneficial results in epilepsy, chorea and convulsions. In infantile tetany, Loewenthal and Wiebrecht obtained good results, while other investigators reported failure.

The methods of administering the parathyroid extract are the same as the thyroid. The dried glands on the market are not reliable. Berkeley and Beebe have recommended for hypodermic use a nucleoprotein prepared from saline extracts of the gland by precipitation with dilute acetic acid. The dose is fifteen minimis of the one to one thousand solution several times a day. In injecting, care should be taken not to enter a vein, owing to the danger of thrombosis.

**The Thymus Gland.**—The thymus gland exerts its action only during early life and the study of its functions and disturbances, therefore, is important to pediatricians. It is relatively largest shortly after birth when it constitutes about forty percent of the body weight (Hunt). It increases in size until puberty, when it decreases and is replaced by fat.

It is now believed that the thymus produces an internal secretion affecting nutrition, especially in fetal life and early childhood. It must have a great deal to do with the production of calcium and

phosphate salts in the normal growth of bone, for it is active during the bone growing period and atrophies when the child reaches puberty and the largest part of bone growth has been completed. It is probable that the thyroid takes up the necessary metabolic work of the thymus from then on. During infancy and childhood, the influences of the thyroid are checked by the action of the thymus, the lymphatic system and, possibly, the pineal gland. The condition known as *status lymphaticus* is probably due to excessive activity of the thymus.

The calcium content of the thymus makes it valuable in rickets, where there is a waste of calcium due to a disturbance of some internal secretions, probably the thyroid, parathyroid and thymus. Thymus gland is administered in the form of dried gland, extract and solutions for hypodermic use.

**The Suprarenal Glands.**—The use of the suprarenal glands as organotherapeutic agents has not been successful, but an active principle called epinephrin has been used in many conditions in which the question of suprarenal insufficiency was not involved.

Its best field is in the control of hemorrhage and as a cardiovascular stimulant. It is a stimulant of the sympathetic nerve. When applied locally, it produces a constriction of the surrounding blood vessels thus arresting hemorrhage.

It is useful in diphtheria to relieve prostration and asthenia. Favorable results have been reported following its use in low blood pressure of pneumonia and in acute infectious diseases of children. Valkova reports that in six cases of pleurisy in children ranging from two to ten years of age, he injected epinephrin into the pleural cavity, this being followed by a

rapid absorption. He noted a temporary acceleration of the pulse in two of the cases with diuresis and a slight glycosuria, due, doubtless to too large a dose. He began with 0.15 c.c. (2.5 minims) later increasing it to 0.3 c.c. (5 minims) and in one case to 0.5 c.c. (8 minims). Wedensky reported a series of twenty cases of pleurisy with effusion in which injections of one to one thousand epinephrin solution were made into the pleural cavity. The amount used was 0.3 c.c. and on the four or five succeeding days 0.2 c.c. in saline. The temperature was lowered, and effusion diminished. He also used this method in dry and purulent cases with good results.

Paoloantonio cites a case of scarlet nephritis in a child of five. On the fifteenth day of scarlet he injected epinephrin to arrest a hematuria; nephritis and edema also being present. By the third day after the injection, the albuminuria had diminished in amount, edema had decreased, diuresis increased, and the bleeding had stopped. He then gave the epinephrin by mouth. On the tenth day, the urine was practically normal. Encouraged by this, he tried epinephrin in thirty cases of scarlet nephritis with good results. His dosage was from ten to twenty minims of the usual one to one thousand solution, by mouth, except where the case called for subcutaneous injections.

In bronchial asthma, the use of epinephrin, alone, or in conjunction with thyroid and pituitary gland, has been attended with beneficial results.

The preparations used are the dried gland and the solution of the chlorid of epinephrin. The latter is the more reliable and efficacious. It is usually made up in a one to one thousand solution in saline and should be kept in a dark colored bottle as it deteriorates on exposure to the light.

When the solution assumes a brown color, it is useless.

Epinephrin should not be given in too strong a solution or in too large a dose. As the suprarenal hormone has the same effect on carbohydrate metabolism as that of the thyroid, care should be taken in the use of epinephrin in children with a diabetic tendency. Glycosuria has been produced in several cases.

**The Hypophysis.**—The hypophysis or pituitary gland consists of an anterior and posterior lobe which are connected by an isthmus or intermediate lobe. The knowledge of the functions of the gland has been increased in the past few years by a vast amount of work, experimental and clinical, on its internal secretions. It is now accepted that the two lobes have each an independent internal secretion. The anterior lobe is essential to life, its removal being followed in a short time by death. Its hormone influences skeletal and sexual development, controls the accumulation of fat and the nutrition of the skin and appendages. Partial removal or disease results in retarded growth, obesity, atrophy of the sex glands and other nutritional disturbances. Gigantism and acromegaly result from hyperactivity of this hormone. The nature of the action of this part of the hypophysis is still unknown.

The posterior and intermediate lobes furnish a hormone that has an action on the kidneys, plain muscle, and on carbohydrate metabolism; hypersecretion being accompanied by a glycosuria and diminished tolerance for sugars, hyposecretion by an increased tolerance.

The use of pituitary extract in pediatrics has not been fully developed. The relationship of the pituitary gland to calcium metabolism has not yet been determined but there probably is an important

connection due to the influence of the hypophysis on bone growth, development and metabolism.

It should be of great benefit in dwarfism, rickets and conditions of retarded bone growth. Theoretically it should relieve obesity in children, for this condition is due to faulty activity of the gland; in practice the results have been variable. Some writers like Williams, Mummery and Klotz have advocated its use to increase the blood pressure in diphtheria, pneumonia, typhoid and other acute infectious diseases, in place of epinephrin, claiming that it has a better action than the latter.

It is used in the form of the fresh gland, dried glands and aqueous extract for intramuscular or subcutaneous injection.

In giving this brief resume of the uses of organotherapeutic agents in children, I have tried to include those only that have been used and fair results obtained. It must be remembered that this branch of therapeutics is still in its infancy; that there is yet a good deal to learn and that we shall probably have to unlearn some of the things we now accept. The results of this form of therapy have, in some cases, been marvelous, testing the credulity of some and calling forth the skepticism of others. In reading the reports of the various workers in this field we must appreciate their enthusiasm, for enthusiasm is a necessary quality in pioneers.

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#### THE TREATMENT OF HYPER- THYROIDISM BY AN ANTI- SERUM.

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The treatment of hyperthyroidism by a specific anti-serum has now had a trial for a period of eight years during which time its effect on more than 3,000 patients has been observed. The results have been of such a character that I feel justified in saying that it is no longer an experiment except in the sense that all therapeutics is experimental. The reaction of such a complex organism as a human being to a given line of treatment can never be precisely foretold. Brief reports have been made from time to time of the results which have been obtained and it has been used by many physicians in this country and abroad.

The investigations of recent years have not served to confute the belief that the thyroid gland may under certain conditions become over active and give to the tissues an over supply of thyroid secretion. The evidence for this belief is both clinical and experimental. The over supply is evidenced by the reactions which it produces. No method has yet been devised for demonstrating the secretion in the blood, but its overabundance is followed by fairly definite results in most instances. A great deal has

been written about dysthyroidism, a condition of perverted activity of the gland, and such a condition probably exists, but we can not as yet define its mechanism in chemical terms. We have good evidence that thyroid activity is produced by giving pure proteids isolated from the glands, and we find in the thyroid proteids of a peculiar chemical character found nowhere else in the body.

If a serum is prepared by inoculating these proteids from a human thyroid gland into an alien species of animal, we can demonstrate that it has a special affinity for combining with this antigen in preference to other human proteids. Such a serum will to a considerable degree serve as an antagonist to the excess of thyroid in the blood and tissues of a patient suffering from hyperthyroidism.

Briefly, the serum is prepared by inoculating either rabbits (preferably Belgium hares) or sheep with nucleoproteid and globulin prepared from human glands. The inoculation must continue over a period of five to seven weeks, at intervals of about six or seven days before the animal is sufficiently immune to make its serum have decided therapeutic value. At the end of this time the animals are bled and this serum prepared for inoculation in the usual way. After the first bleeding the animal may be inoculated again two or three times and a second bleeding made, but it has been found advisable to repeat this process more than three or four times, since the quality of the serum depreciates after this experience.

The success of treatment depends upon a knowledge of the disease and the skill with which the remedy is applied. The more the intelligence of the physician with respect to these two points the more certain is he of success.

It is impossible within the limits of this paper to describe the great complexity of

the disease. Probably no one factor is of so much value as an accurate diagnosis and by this I do not mean simply a naming of the disease, but a careful analysis of all the factors which have led to the condition, and an accurate analysis of the results produced. The earlier the diagnosis can be made the simpler the problem becomes. It is most unfortunate that its early development is not accompanied by pain or some striking lesion visible to the patient which would take him to the physician for treatment at a time when the correction of the difficulty is comparatively simple. This is no excuse however for the mistakes in early diagnosis which now so frequently occur.

Because serum is used as a therapeutic agent in the treatment of this disease, there should be no relaxation in the other common-sense medical measures to be employed. No sane physician would permit a patient, having a cardiac disturbance and the general physical debility often seen in Graves' disease, to be active physically. However, because such patients have no pain, and because until they reach the point of physical exhaustion they often feel very well, an amount of physical activity is allowed them, which is quite unwise and unwarranted. In the beginning of the treatment the patient should be put to bed and kept at rest for from two to six weeks. Few visitors and very little excitement should be permitted. An abundance of well-cooked food, avoiding tea, coffee, alcoholic stimulants and meat, should be provided. Such simple directions as these seem hardly necessary, and yet experience shows that they are frequently neglected.

The serum is administered by hypodermic injection. The writer usually gives it in the upper arm, midway between the shoulder and the elbow, on the outer side. The needle

should be pushed completely through the skin and the serum injected into the subcutaneous tissues. The dose varies. The first dose may need to be smaller than those given later on. It is generally wise to begin with an injection of not more than 8 to 10 minims, and follow this in twenty-four hours, if the reaction has not been disturbing, with a second injection somewhat larger; and injections may be continued daily for the first three to five days, gradually increasing the size of the injection until a full tube, 15 to 16 minims, is given at each injection. These are general directions to apply to the average case. With a patient very acutely ill it may be necessary to give, during the first twenty-four hours, two or three full tubes of the serum. Following the inoculation there is likely to be an area of reaction develop at the site of the injection. This in most instances is no more than an area of redness and induration from 1 to 3 inches in diameter. This condition persists for a few hours and then subsides, so that twenty-four hours later the arm is practically in a normal condition again. It occasionally happens that a patient is extremely sensitive to the serum and shows a very marked area of local reaction. The whole arm from the shoulder to the elbow and down to the forearm may be swollen, tense, red, painful, and have something of the appearance of an erysipelas. With a patient so sensitive as this it is necessary to proceed carefully. It does not mean that the patient cannot take the serum, but it is very unwise to inoculate a second time until the reaction of the first injection has entirely subsided. If too early an injection is made, the second reaction will be very much more active than the first one, and the first area of reaction will again develop a condition very similar to what it had at first. If the injections are

repeated too soon, the reaction at each point will be very severe; the former sites of injection will all react again; the patient will have a fever, be nauseated and ill. The proper method to follow in such a case is to allow the first reaction to subside entirely, then begin with a very small dose, 2 or 3 minims, and allow each reaction to subside before giving the one following; and in a short time it will be found that the size of the injection can be gradually increased until a full tube of the serum is given every second day without any disturbance whatsoever. So severe a reaction as that just described is not a common event. In most instances serum can be given with only a slight area of local reaction and no general disturbance. Very rarely the writer has observed a reaction which shows some of the phenomena of an anaphylactic disturbance. This occurs only very rarely, indeed, and seems to bear no relation whatsoever to the amount of serum injected, the interval between the injections, or the length of time which the patient may have had the serum given. He has observed it to occur after the patient has had the serum for three months at intervals of two days. The injection is followed almost immediately by a very severe pain in the back, difficulty in breathing, which may amount to a fairly marked dyspnea, swelling of the eyelids, nose, lips, ears, and marked cutaneous flushing. In two or three instances there has been a short period of syncope. The symptoms very promptly pass, and the patient is soon quite all right again; but after a reaction of this sort it is unwise to inoculate again for a period of two or three weeks. If another inoculation is made within two or three days, the same phenomena are likely to occur again, not invariably so, and it is not possible to quote a very large number

of cases on this point because the reaction is so rare; but in most instances in which injection was given again after an interval of two or three days, there has been a development of a similar disturbance, perhaps more severe than that noted at first, and it is best, therefore, to allow a period of two or three weeks to elapse before another injection is made, and then to start in with a small dose, not more than 3 or 4 minims. In one patient such a reaction occurred at three different times, without previous warning, at intervals of about two months. In most cases, however, absolutely no difficulty will be experienced in the administration of the serum.

The length of time which the serum will need to be continued depends a great deal upon the character of the case. The cases that are treated very early in their development may need to have serum given only for a period of three or four months, while in others that have existed for a longer time it may be necessary to give serum for eight, ten or twelve months. One point it is very necessary to bear in mind, and that is that after the patient has been restored to apparent health it is not safe to stop the injections suddenly. The interval between them must be gradually increased until finally an injection is given once every eight or ten days, and it may be necessary to keep up the treatment at this interval for four or five months before it is safe to allow the patient to go free entirely. If the treatment is interrupted when the patient has made very satisfactory improvement and is apparently well, the good conditions are likely to continue for six to eight weeks, and then show a gradual return of the disease. A redevelopment of the symptoms means that serum must be given again immediately, and a relapse is in most cases readily controlled

by this means, but it sometimes happens that a relapse is much more difficult to control than a primary attack.

In the writer's judgment iodine administration should always be begun with small doses, not more than one grain three times a day. With an active gland the administration of iodine may only feed a flame, and the patient should be under constant observation so that its administration may be stopped instantly when it proves to be injurious. Many comparatively harmless goitres can be started to a dangerous activity by the injudicious use of iodine. Recent experiments indicate that the restoration of an active hyperplastic gland to comparatively normal histological conditions is favored by iodine administration, but it must be remembered that such a gland is capable of using this iodine in the proportion of more active secretion, and iodine administration is in such cases physiologically equivalent to the administration of thyroid extract.

In conclusion, I wish again to emphasize that there is no more important feature in the medical treatment of Graves' disease than an early, accurate diagnosis.

The question arises as to how much benefit may be expected and how soon it may be expected. The answer to this question varies a great deal with the different types of patients. With those who are extremely sick in the acute, severe toxic form of the disease, very marked improvement is often noticed in thirty-six to forty-eight hours. This improvement may be so striking that the whole picture of the disease is changed and a convalescence dates from this time.

It is in just this type of case that the most dramatic results are obtained, and the most convincing evidence appears that we are really combatting a toxin with an anti-toxin. With the less severe conditions, the

improvement is generally slower and it may be three or four weeks before the physician is able to convince himself that definite, objective improvement has been produced. The patient, however, generally experiences some relief and will frequently express themselves as feeling very much better before the physician is able to see that the condition has much improved. This improvement is generally in the nature of an improved heart action, the cardiac impulse being much less forcible. Although the frequency may not be diminished, the patient is less nervous, sleeps better, eats better, is mentally more quiet and stable, and the gastro-intestinal disturbance, if it existed, is in most cases soon relieved.

The chronic forms of the disease are the slowest to yield, and I have repeatedly had patients in whom serum was used for six to eight weeks before any evidence of benefit was obtained. Such patients should be frankly told in the beginning that improvement will be slow, but when the disease has existed for eight to twelve years and is gradually getting worse, that period is, in the experience of the patient, a comparatively short time. It is only by recognition of this fact that either the patient or the physician will have sufficient amount of courage and patience to keep up a treatment for two months which is apparently doing no good. The ultimate recovery of so many cases which have belonged in this class, has given me a sufficient amount of optimism to proceed in what might seem to be the most discouraging circumstances.

When the serum is to be used for so long a time as that, it ceases to be in any way annoying and is regarded by the patient with the same degree of composure as the breakfast or morning bath.

The next question as to how long the treatment must be continued is equally interesting. In the acute cases, complete recovery which was permanent, has followed the use of serum for from two to six weeks. In most cases, however, it is not safe to stop the injections after so short a time. I believe that in my experience the longest period during which I have given serum to one patient has been twenty months. In this case there was complete recovery after the disease had lasted for nine years. During the latter part of the treatment, the injections may be comparatively infrequent, often one injection being made from ten days to three weeks; while during the earlier part of the treatment, the injections would have been given every second day. I am convinced that to be safe, the treatment must be continued for some time after the patient feels perfectly well, for unless such a method is followed, some unusual degree of physical exertion or mental strain will be followed by an annoying temporary exacerbation of the symptoms. Even after the treatment has been stopped, the patient should be under the observation of a physician who may detect the earliest evidences of any recurring trouble and stop it before it has proceeded to any degree of severity.

Finally I would say, that it is quite unwise for the physician to rely on serum, or any other form of medicine, to the exclusion of all simpler measures which I outlined in the beginning of the paper. It is necessary to emphasize this point for I have frequently been consulted with reference to patients who had been treated on the supposition that if only the serum were given, they might continue to do as they please and their recovery would be assured.

We would regard any physician as foolish and unprofessional who would permit a diphtheria patient with a severe myocardial lesion to run about and play with the activity of a normal child, even though an abundance of the most active antitoxin had been given.

This serum will not cure all cases of Graves' disease, but I am certain that it gives to the physician an additional weapon of considerable power in combatting this distressing disorder and that when it is properly used the necessity for a resort to surgical measures will become a much less frequent incident in the treatment of patients with exophthalmic goitre.

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## THE PARATHYROID GLAND.

### A Brief Digest of the Literature of 1912-1913.

BY

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Since the publication of a review<sup>1</sup> of the literature concerning the parathyroid glands up to the end of the year 1911 some advance in the knowledge of this subject has been made.

**Anatomy.**—The papers of Fischer, Mayo and McGrath, Ginsburg, Lairgne-Lavastine, Grosser, Guizetti and Roussy bring little that is new concerning the gross or microscopical anatomy of the glands. Bobeau was able to stain distinct mitochondria in the epithelial cells and to trace their course in some instances almost through the whole length of the cell.

<sup>1</sup> MacCallum. *Ergebnisse der inneren Medizin u. Kinderheilk.* 1913, XI, 569.

**Physiology.**—The relation of the destruction of the parathyroids to the development of tetany, well established before, has received new confirmation by Marine who finds that in animals on a calcium poor diet the symptoms develop much more quickly after parathyroidectomy than in those which received a considerable amount of calcium in the food. Dogs could be kept alive and well by the administration of calcium if some accessory parathyroid tissue were left in situ although this in itself might not be enough to prevent tetany. No such prolongation of life was possible if all parathyroid tissue was destroyed.

MacCallum showed that on the removal of the parathyroid glands the blood of the animals in tetany became altered in such a way that when it is made to bathe the nerves of a normal animal it quickly throws them into the state of electrical hyperexcitability characteristic of tetany. In a later paper he showed that the mere addition of an extract of the parathyroid gland to such blood had little or no effect in counteracting this property although the injection of such an extract into the veins of a parathyroidectomized animal might keep it alive longer than one not so treated. Therefore it seemed that the evidence is rather opposed to the idea that in tetany there is a circulating toxine in the blood. The widely accepted idea that the presence of such a toxine is demonstrated by the fact that if the blood of an animal in tetany be removed in part and replaced by physiological salt solution the symptoms disappear, was disproven by the observation that such a procedure greatly lowers the excitability of the nerves in normal animals also. It seems to be merely a question of malnutrition and in tetany the hyperexcitable nerves are so dulled by being sup-

plied only with such greatly diluted blood that the characteristic twitching becomes impossible. MacCallum and Vogel by new analyses of the blood of animals in tetany confirmed the statements previously made that there is a great reduction in the calcium content as compared with that of normal animals and this remains true even in animals into which frequent injections of parathyroid extract have been made. All of these observations tend to support the theory that tetany is dependent upon a disturbance of the calcium metabolism.

Other purely experimental studies of tetany have been carried out in the past two years. Mustard repeated the work of Lanz, MacCallum, Biedl and others with regard to the source of the nervous impulses in tetany and found that removal of the motor cortical region on one or both sides had no influence upon the twitching whether the operation was performed before or during the tetany. Transection of the spinal cord almost abolishes tetany in the paralyzed portions, the "spontaneous" contractions of the paralyzed limb being probably reflexes. Impulses seem to come from the brain below the motor cortex. Cutting of the sensory nerves does not affect the severity of tetany in a limb.

Carlson found that the power of an animal to develop immunity is diminished during tetany. He tested this with relation to the production of a hemolytic serum for foreign corpuscles and thinks it may explain the susceptibility of animals in tetany to conjunctival and other infections.

Rossi experimenting with sheep confirmed the older results that these animals possess many accessory parathyroid nodules but develop tetany if the extirpation is sufficiently complete.

Koch by means of an elaborate chemical

method demonstrated the presence of methyl guanidin in considerable quantities in the urine of dogs in tetany. So far this work has not been repeated nor its significance properly estimated. Freund found what he thought must be a combination of glycuronic acid in the urine of infants suffering from tetany and regards it as an intermediary metabolic product. Liefmann found acetone in the urine and suggests a search for diacetic and betaoxybutyric acid. Keeton under Carlson shows that during tetany the secretion of gastric juice is lessened and the acid production decreased as well as the pepsin so that digestion and consequently active secretion is prolonged. Calcium salts greatly improve the secretory mechanism.

With regard to the relation of tetany to certain poisons, there has appeared nothing of importance except the more extended paper of Fuchs pleading the similarity between epidemic tetany and a mitigated form of chronic ergotism. Oxalate poisoning studied experimentally by Chiari and Froehlich, Sarvonat and Roubier and others has shown the increased mechanical and electrical excitability of the motor nerves as well as the increased excitability of the sympathetic and autonomic nerves to adrenalin and pilocarpin. All this is ascribed to the loss of calcium through precipitation. Kehrer saw a case in which after a large dose of oxalic acid taken as an abortifacient there was outspoken tetany. Probably in this instance the effect of the oxalic acid was intensified by the pregnancy.

Georgopoulos in two rather fanciful papers states that the parathyroids exert an inhibiting influence upon the secretion of the chromaffin tissue, and that they are important as detoxicating organs in neph-

ritis, but being antagonized by the thyroid he suggests extirpation of the thyroid to allow them the better to unfold their influence.

**Parathyroids in Osteomalacia and Rickets.**—The experiments of Erdheim on the disturbances of calcification and ossification in parathyroidectomized rats and the suggested relation of rickets and osteomalacia with the parathyroids are well known. Hohlbaum, however, opposes to these his experiments in which he finds, it is true, changes in the teeth after parathyroidectomy but none in the bones, while in rachitic or osteomalacic rats the reverse is the case. In a case of human osteomalacia he found great hyperplasia of the parathyroids, and so did Todyo in a similar case. Bauer describes tetany in a case of osteomalacia. Both conditions disappeared with adrenalin treatment and recurred together. Somewhat similar is Ebstein's case of late rickets with osteoporosis and spontaneous fractures, laryngospasm, cataract, and outspoken tetany in a man of thirty-one. Treatment with calcium lactate was successful in curing the tetany.

**Tetany in Pregnancy.**—Several papers deal with the fact known from Vassale's vivid description, that animals deprived of part of their parathyroid glands and showing no tetany develop such symptoms during pregnancy or lactation. Frouin, Morel, Massaglia, Marine and Carlson have all repeated this work with the same results. Massaglia thought the parathyroidin of Vassale relieved the convulsions while Frouin combated them successfully with calcium chloride. Erich Meyer saw two instances of tetany in gravid women which were cured with calcium chloride and Kehrer in a long paper reviews all of the many cases which have been described,

adding several of his own. He, too, observed excellent results from the administration of some salt of calcium in these cases. Seitz opposes the view held by some Italian writers including Vassale and Massaglia that eclampsia gravidarum is dependent upon parathyroid insufficiency since the electrical excitability of the nerves is unchanged in eclampsia.

**Tetany and Nervous System.**—Möllgard finds no Nissl changes in the cells of the central nervous system in tetany but does find instead of the network which the normal protoplasm shows by his own special method, a granular condition which may retrogress and leave the cells normal if the tetany is survived. Edmunds found extensive chromatolysis in the cells of the brain and cord in animals kept alive after parathyroidectomy by calcium lactate. Gjestland studied the parathyroids in a case of paralysis agitans and found them greatly hypertrophied, one measuring 40 x 10 m. m., but he admits that this may be a coincidence although it may have a real relation to the disease. There were no special histological changes.

**Tetany in Adults.**—Various papers record cases of tetany in adults occurring spontaneously or after operations upon the thyroid with injury to the parathyroid glands. Schultze observed a curious persistence of the contraction of a muscle after mechanical or galvanic stimulation such that in the tongue a dell is formed and remains some time. This does not occur after faradic stimulation and in this way it is different from myotonia. The papers of Peritz, Erben, Proscher and Diller add little to our knowledge. Peritz emphasizes the hyperexcitability of the autonomic nervous system causing hypertension of the arteries, cold hands and feet,

etc., and the distinct increase of mononuclear cells in the blood.

Pool and Turnure describe a case of post-operative tetany relieved by implantation of a parathyroid from another patient and Morel reviews the whole subject of parathyroid grafting emphasizing the importance of rapidity of execution of the operation, of the intimate relation of the recipient to the donor, and of the need for such tissue which aids in the establishment of the graft. Shepard observed a case of tetany after the removal of an extensive goitre and kept the patient relieved for months by the administration of calcium lactate. Curschmann argues strongly in favor of calcium therapy in chronic tetany and in parathyreogenic epilepsy—that is, epilepsy in which there is a history of spasmophilia. Treatment with extracts of parathyroid has not been recorded with much enthusiasm in recent papers.

**Infantile Tetany.**—The great bulk of the literature of the last two years concerns the so-called spasmophilia of infants or infantile tetany, and especially the influence of various foods and the part played by inorganic substances. Bliss, Jörgenson and Longo could find no changes in the parathyroids in such cases. Thorspecken investigated their stomachs with radiograms with negative results. Kemmetmuller observed edema of the legs. Valdemare thinks adenoids an important etiological factor. Pollini found sclerosis of the parathyroids but thinks the hemorrhages found by many writers are unimportant except to exacerbate existing insufficiency. Longo and Fede suggest the possible anaphylactic nature of spasmophilia and at first sight this seems supported by the occurrence of bronchial spasms as described by Lederer which may

cause atelectasis or emphysema. Lederer shows, however, that these spasms do not respond to adrenalin and are therefore different from those of asthma. The same suggestion of the anaphylactic nature of tetany has been made by Kling (*Zeit. f. Immunitätsforschung*, 1912, XIII).

With regard to the relation of calcium to spasmophilia, Cohn and Schwarz and Bass have been unable to show any diminution in the percentage of calcium in the brain. Lust thinks that the potassium salts accentuate tetany and through antagonizing calcium are probably the injurious element in cow's milk. Freudenberg and Klocman, Blühdorn and Zybell write in favor of the use of calcium salts in the treatment of infantile tetany. Blühdorn recommends non-crystalline calcium chloride as a palliative—combined often with chloral hydrate. The first named authors describe excellent results from calcium saccharate, and Lipocalcin the method of preparation of which they withhold.

Zybell in a long review of the alimentary factors in spasmophilia describes a wave-like curve of excitability for the cathode opening shock in spasmophilia. He states that in hunger the tetany becomes more severe. He is doubtful about the effect of cow's milk—it may actually do good and excitability may increase when it is withdrawn. Carbohydrates are indifferent and breast feeding, while very beneficial cannot absolutely prevent tetany. Calcium and magnesium distinctly lower the excitability while potassium increases it. He recommends finally the improvement of the general nutrition rather than dependence upon a single drug.

Petrone and Vitale have tested parathyroidin Vassale both by mouth and subcutaneously without any effect.

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## MEDICAL HINTS.

Sir Dyce Duckworth in the *British Medical Journal*, says that the man who withholds a remedy that has been found valuable because he does not understand its action is not a truly scientific practitioner.—*Medical Summary.*

## ACTION OF THE ANIMAL EXTRACTS AND QUININE UPON THE VOLUME OF THE SPLEEN.<sup>1</sup>

BY

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regulate the rapid variations of the portal circulation. One<sup>1</sup> of us has shown that of all the glands with an internal secretion, the splenic extract has the most powerful action upon the intestinal peristaltic movements. Zuelzer has confirmed this fact by his hormonal.

No studies upon the variable volume of the spleen by the action of animal extracts



FIG. 1.

FIG. 1. Effect of adrenalin 0.0118 c. c. on splenic volume.

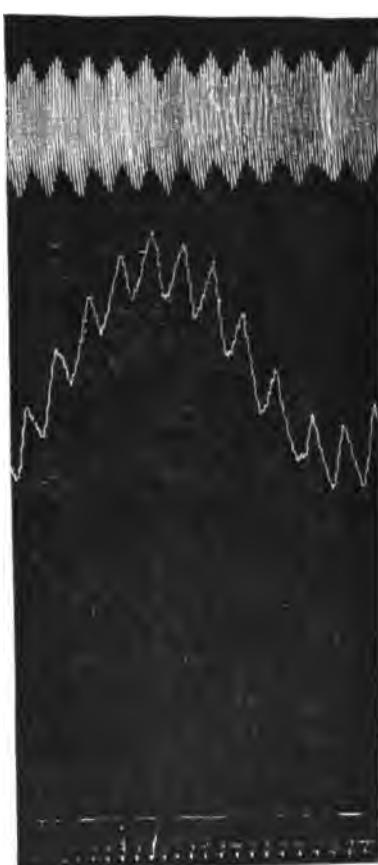


FIG. 2.

FIG. 2. Eight minutes after the injections showing increase of volume. Top line, blood-pressure. Second line from top, splenic volume. Time, every 2 seconds. The small waves in splenic volume are due to the diaphragm impinging against oncometer.

It has been known for a long time that the spleen changes its volume in a rhythmical manner. It is a vascular reservoir to

have been made so far as we know. Our experiments were made chiefly upon etherized cats by an oncometer devised by Dr. Scott. This was attached to a modified

<sup>1</sup>These experiments were made previous to the late judicial decision in Pennsylvania on experimentation.

piston-recorder. The infusion of the animal extracts was given by the jugular. The blood-pressure was taken at the same time with a Hürthle manometer.

0.0059 c. c. of adrenalin solution primarily decreased the splenic volume, after which it became larger than normal. The

marily reduced the volume of the spleen, and then increased it beyond normal. Infundibulin elevated the blood-pressure. The pulse rate was a little slower. When the pulse and pressure were normal the volume of the spleen was still increasing (Fig. 2).



FIG. 3.

FIG. 3. Effect of 0.0149 c. c. infundibulin pituitrin solution on splenic volume.

FIG. 4. Five minutes after the injection showing the increase in volume. Top line, blood pressure. Time, every 2 seconds.

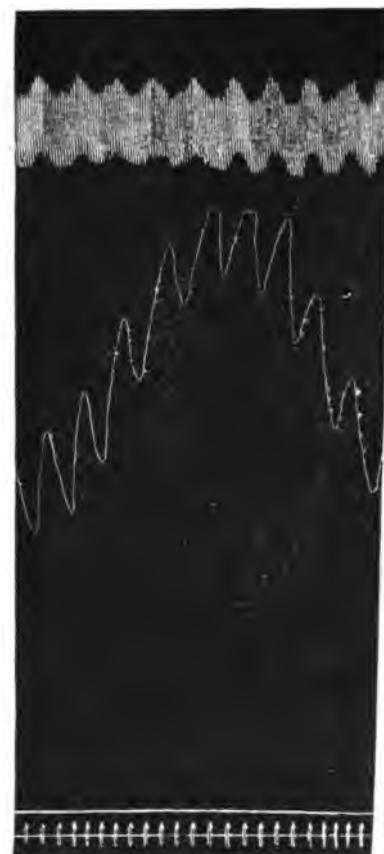


FIG. 4.

blood-pressure was increased and the pulse rate slower. When the pulse and pressure were normal the splenic volume was increasing. The rhythmical variations of the spleen were greater and more frequent (Fig. 1).

0.118 c. c. of infundibulin solution pri-

0.0328 gram of dried spleen in the shape of an infusion lowered for a few seconds the volume of the spleen and set up large rhythmical waves, whilst the blood-pressure at the moment of injection fell momentarily and then rose to normal. The pulse rate was for a very short time slower (Fig. 3).  
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An infusion of 0.0324 gram of fresh corpus luteum increased the volume of the spleen, whilst the blood-pressure fell for a few seconds and then became normal. There was for five seconds a slowing of the heart beat. The rhythmical variations were greater in size.

ovary diminished for a few seconds the splenic volume and then returned to normal. The arterial tension fell for a few seconds and then returned to normal. The pulse rate was slower.

An infusion of 0.0162 gram of dried orchitic extract slightly diminished for a

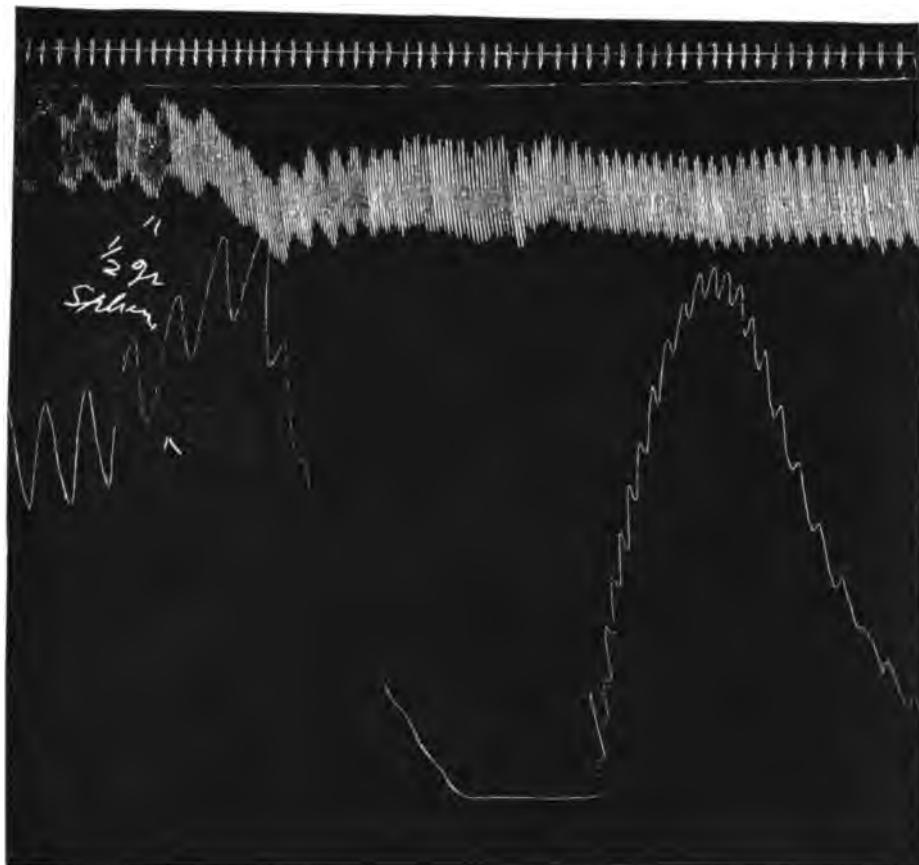


FIG. 5. Infusion of 0.0328 gram of powdered spleen on splenic volume; lower line splenic curve; next line, blood-pressure; top line, time, every 2 seconds.

An infusion of .06 gram of thymus for a few seconds decreased the size of the spleen and then increased it beyond normal. At the same time the thymic infusion lowered the blood-pressure for a few seconds, after which it became normal. The pulse rate, slower for a few seconds returned to normal.

An infusion of 0.0162 gram of the dried

second the volume of the spleen, after which it was slightly increased. The blood-pressure at the time fell for a few seconds and then became normal. The beat of the heart was normal.

An infusion of 0.0648 gram of dried pineal for a few seconds diminished the size of the spleen, after which it was normal. At the same time the blood-pres-

sure was considerably diminished for a few seconds and then became normal.

An infusion of 0.0162 gram of parathyroid slightly diminished the size of the spleen, after which it became a little larger.

mammary gland did not change the splenic volume. At the same time it lowered arterial tension for a few seconds. The pulse rate was not altered.

An infusion of 0.015 gram of dried pan-



FIG. 6. Effect of a neutral solution of hydrochloride of quinine 0.015 gram per jugular on the volume of spleen and the circulation on time every 2 seconds; the frequent curves on bottom curve are due to diaphragm impinging on the oncometer; the large wave is splenic; blood-pressure above it.

At the same time the blood-pressure fell for a few seconds and then was normal. The pulse rate was slightly slower for a few seconds.

An infusion of 0.0162 gram of dried

creas did not change the splenic volume, although it depressed the arterial tension considerably for about eight seconds, after which it became normal.

A solution of 0.06 gram of iodothyroin

powder reduced for a few seconds the size and then increased the volume of the spleen beyond the normal. At the time of injection the blood-pressure fell considerably and then rose above normal. The pulse rate was momentarily slower.

We can tabulate the action of the animal extracts upon the spleen as follows:

INCREASING SPLENIC VOLUME BEYOND NORMAL	DECREASING SPLENIC VOLUME.	CAUSING LARGE RHYTHMICAL CONTRACTIONS OF SPLEEN.
Adrenalin, Infundibulin, Corpus luteum, Thymus, <b>Orchitic Extract,</b> Parathyroid, Iodothyron.	Ovary, Pineal.	Extract of spleen.

Now how are these results to be explained? There is not much doubt that the splenic extract increases the waves of the spleen by an action upon the plain muscle fibers of the capsule. As to adrenalin and infundibulin (pituitrin), the action is vasomotor. As to the other active principles of the internal secretions their action is probably vascular. The hydrochloride of quinine in 0.008 grain doses did not change the volume of the spleen. Doses of 0.015 grain in some cases at first caused a fall in volume and then an increase above normal. In other cases this dose produces an immediate increase (Fig. 6). This increase is probably vascular.

#### MEDICAL HINTS.

Measles is the most contagious of all the infectious diseases, with the possible exception of smallpox in the unvaccinated.

In fungous endometritis and in the metrorrhagia of uterine fibroids potassium iodide is well worthy of trial. It may also be tried in cases of threatened abortion.—*Medical Summary.*

#### GOITRE IN FOWL.<sup>1</sup>

BY

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During the early part of last fall, I received from Dr. Chevalier Jackson of Pittsburgh, a hen about eleven months old, hatched (incubator) from eggs of a fancy (Orphington) stock. The fowl was referred to me on account of a tumorous mass at the base of the neck on the left side, hanging over the left pectorals. The mass was the size of a tangerine orange, freely movable under the skin, and permitting considerable displacement from the pectoral region upwards into the neck. The tumor was well below the clavicle. No definite point of attachment could be made out on superficial examination, and no other nodules were recognized. The bird appeared in good condition, and was unusually docile. The tumor gave rise to no pressure symptoms, and did not inhibit the animal in feeding.

The rather superficial position which the tumor occupied permitted an easy approach by operation. The mass was well encapsulated, and readily enucleated from its surroundings. It was found, however, that its attachment to the vessels at the root of the neck was very intimate, and an abundant supply of thin walled vessels passed into the capsule, and entered the substance of the gland. A firm ligature was passed about the base of the mass, leaving some of the tumor tissue attached to the large vessels. The tumor was removed and the vessels to the stump were not interfered with. During the removal, the circulation of blood within the enlarged and thin walled vessels could be readily observed.

The specimen which had been removed from the left thoracic region just below the clavicle consisted of a spherical tumor weighing 55 grams. The tumor measured 5.5x4.5x4.25 cm., which on account of

large vessels projecting over the thoracic opening. Large vessels were seen to course over the tumor as well as to enter its substance. The tumor was of a brownish yellow color and appeared to be made up of

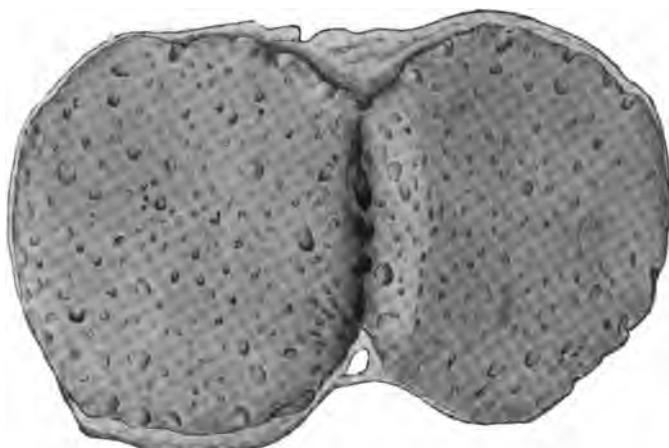


FIG. I. Colloid goitre of hen.



FIG. II. Colloid goitre of hen. Blood pigment and cholesterol in colloid secretion.

shrinkage after the vessels were severed was smaller than the original mass when in situ. It was well encapsulated and its lower pole was closely adherent to the

many small cysts and yellow granular masses. When cut through, a thin yellowish secretion escaped. The cut surface showed a shiny and diffuse stroma be-

tween whose strands many small cystic cavities, some of which contained a glassy colloid material were found. Some of the cystic areas also contained small yellow, almost fatty looking masses. Much of the secretion was quite watery.

Sections of the tumor showed a loose alveolar arrangement with relatively little stroma. The alveoli formed large spaces containing a secretion, in part being like colloid but not infrequently showing the presence of many desquamated cells as well as leucocytes. These alveoli with open spaces were large and of relatively uniform size. They were lined by cubical cells which were quite regular. In some of the areas, the tissue was more solid and the alveoli were small and not dilated. The epithelial structures here tended to form gland-like masses with small lumina and only occasionally containing colloid. In these smaller epithelial structures the lining epithelium was thrown into folds and in part appeared as if there was some proliferative reaction. In the same field could be seen dilated alveoli with homogeneous or granular contents, and small hyperplastic alveoli with irregular epithelial lining. Here and there the contents of the alveoli showed the presence of clefts like those left by cholesterol crystals. Hemorrhage was not uncommonly observed within the alveolar spaces. In some instances this hemorrhage appeared quite recent and the blood cells were well preserved. Elsewhere again, blood pigment was present within large mononuclear cells and leucocytes which had migrated into the alveoli.

True goiterous tumors in fowl appear to be quite unusual. The normal thyroids in birds may be quite readily demonstrated in close connection with the great vessels at the root of the neck.

A further report of the clinical manifestations and of the chemical nature of the thyroid contents will be made by Dr. David Marine of Cleveland.

## SECRETIN—ITS USE AS A THERAPEUTIC AGENT.

BY  
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The internal secretions with their activators have recently been given more thought and study by internists and their physiological action is thus better appreciated than ever before in the history of medicine. The one which will be dwelt on in this paper, secretin, is perhaps of greater importance than any of the other excitants demanded in digestion because it is one of the factors necessary towards maintaining the normal physiological balance of the pancreas, liver and small intestine.

When pepsin, some thirty years ago, was first advocated in gastric disorders, a field for the use of glandular extracts was opened. Pepsin in its use has achieved a permanent place in therapeutics but I am firmly convinced that the value of secretin, when it is properly employed, will far outweigh that of pepsin or any of the other ferments. The observations made on over one hundred cases with the most brilliant results ensuing, has led me to give a brief outline of what secretin is and how it should be used in this, the first paper devoted to its clinical importance.

The discovery of secretin might be termed accidental because of the phenomenon first noticed by Dolinski and Gottlieb that when dilute hydrochloric acid was introduced into the digestive canal, a perceptible increase was noticed in the secretions of the pan-

creas, which led other observers to question why. Then Popielski, Wertheimer and LePage indicated the fact that the hypersecretion of the pancreas only occurred when an excess of acid media came in contact with the duodenal mucosa. Following these early observations, Bayliss and Starling, in 1902, demonstrated that there must be something more complex as an activating agent of the pancreas than the mere acid reflex and Pavlov directed attention to the fact that it was not an acid, as such, which reflexly caused the secretion of the pancreas to become more profuse but that it was due to the presence of some unknown substance which acted either through the circulation or by stimulating the nerve centers and in this manner caused an excessive flow of pancreatic juice. Bayliss and Starling finally were able to demonstrate that such was the case and were the first to prove in the research laboratories of the University College, London, the presence of an excitant, a hormone, which we now designate as "secretin."

This has since proven to be one of the most important discoveries in physiological chemistry because by virtue of its positive action in stimulating the pancreas, the theory that hormones play a vital part in the chemistry of digestion, was firmly established. Since then a period of twelve years has elapsed with little if any attempt to use this most valuable and potent substance for the relief of pancreatic insufficiency, impaired liver function and several intestinal disorders.

Secretin is not a ferment. It is a heat-stable chemical substance, definite in character and may be prepared by scraping and macerating the duodenal mucosa and then boiling with dilute hydrochloric acid. Edkins has shown that a somewhat similar hormone may be obtained from the pyloric antrum of the stomach; this he has termed

gastrin, since it is capable of increasing the flow from the peptic and oxytic glands of the stomach.

As an indication of the similar physiological stimulus necessary to the normal functioning required by the stomach after the ingestion of food, the well-known standard laboratory experiment may be taken as confirmatory evidence. When food is permitted to remain in contact with the greater curvature and pyloric portion of the stomach, and a decoction of the food and mucous membrane is then injected into the blood-stream, an immediate increase in the secretion of acid and peptic enzyme will ensue; while an infusion of the food alone composed of peptone, dextrin and so forth, intravenously injected will cause no secretory activity. This positively establishes the fact that some agent has manifested itself when the food is in contact with the stomach wall; this agent has been shown to be the hormone gastrin.

Similarly the excitation of the pancreatic secretion is due to the stimulating qualities of secretin when conveyed by the blood stream, and not due to nerve impulses. Bayliss and Starling positively demonstrated that when all communication to the central nervous system had been obliterated, leaving only the blood supply intact, an increased secretion became at once apparent when acid stimulation was applied to the mucosa of the duodenum.

Secretin has still other functions: Delezenne and Frouin, working at the Institut Pasteur in Paris, demonstrated that the action of secretin was capable of increasing the supply of succus entericus. Hallion showed that secretin has a marked stimulating action on the liver and that it is capable of increasing peristalsis in the small and large intestines. In further experiments, associated with Enriquez, it was shown that

secretin was able to increase the amount of bile normally secreted, which has been confirmed by Portier. These facts are of especial importance to keep in mind when we have an increased acidity of the gastric chyme in stenosis of the pylorus or duodenum, in gastro-enterostomy, short circuiting of the intestine, intestinal stasis in chronic constipation, in hypertrophic cirrhosis of the liver and similar troubles where cellular changes have occurred that prevent normal metabolism.

In gastric hyperacidity, we naturally have an increased production of secretin which in turn stimulates the pancreas to excess and if permitted to continue unchecked for a sufficient length of time, the gland may become exhausted and the quantity and chemical efficiency of its secretion will be greatly impaired, or, it may be that the excessive gastric acidity will so stimulate the epithelial cells of the mucosa that the secretin producing mechanism breaks down with a consequent failure of pancreatic flow. Either one or both of these conditions may be met with and here we have a resulting serious interference with the breaking down of the carbohydrate molecule and the protein group which again may be followed by the appearance of sugar in the urine.

In over three hundred cases of diabetes under my observation, approximately 80% had an increased acidity of the gastric chyme. This is a most important point in showing clinically that the acidity of the stomach has a direct bearing upon the incomplete digestion of the diabetic and, as already stated, the consequent functional derangement of the pancreas. Knowing the intimate relations between the pancreas and the liver, if the pancreas is at fault, due to the absence of its normal secretory stimulus or exhaustion of the gland itself, the de-

ficiency of its secretion becomes apparent and we have the phenomenon of glycosuria, due, at least in part, to abnormal excitation of the sugar releasing mechanism of the liver, brought about by hypofunction of its physiological antagonist.

Alfred Hess has thrown a light which is highly illuminating upon the acid condition of the stomach at birth, prior to the ingestion of any food. In fifty-one cases in which the stomach contents were analyzed, hydrochloric acid was present in all but one in the free and combined state. Now our physiologists have as yet been unable to give adequate reasons for this phenomenon at birth and the present theories regarding gastric secretion in infants must be modified. My belief is that the presence of this excess acid is required to start the production of the hormone secretin so that when food is first taken, no difficulty will be encountered in breaking down the carbohydrate and fat molecules which are required for normal digestion. This is further confirmed by our knowledge that after the infant has had several or more feedings the excessive acidity has disappeared and, as Lockwood contends, hyperacidity is a rare condition and should never exist in the normal individual. So the only hypothesis which we may safely assume in the excessive acidity at birth is that it is a physiological requirement demanded for the initial production of the hormone secretin.

In further experiments which Huston has completed it is shown that the pancreatic secretory function demands something besides the stimulus of secretin. He has shown that a certain chemical substance in the blood must be conjointly associated with secretin. The method that he advocates in indicating this is quite simple and most positive. The pancreas of an animal is placed

in a paraffin bath which is allowed to solidify and then is irrigated with fluids which are introduced by means of a cannula through the pancreaticoduodenal artery and then transmitted through another cannula into the portal vein. A third cannula is introduced into the duct of Wirsung to carry away the pancreatic secretion. By this technique he finally was able to prove that the pancreas irrigated alone with Locke's physiological serum, normal blood, or a secretin solution gave a negative response. But when irrigated by a combination of either—the serum or normal blood combined with secretin—a profuse flow of a clear fluid containing all the pancreatic ferments will be immediately noticed. This remarkable demonstration has had a marked effect upon many of the non-believers of the secretin theory.

As has already been shown, when hydrochloric acid comes in contact with the epithelial cells lining the mucous membrane of the duodenum, secretin is in this way manufactured. It then passes into the circulation and is carried to the pancreas where its chemical composition is changed by combining with amylopsinogen and steapsinogen to form the ferments amylopsin and steapsin. Secretin also united with pro-trypsinogen to form trypsinogen, which is not converted into trypsin until it is activated by enterokinase in the small intestine.

Secretin so far has had a very narrow field in therapeutics and this I believe is due to the small amount of clinical data that has been given out by the internists who have theoretically suggested its use. I believe there is only one clinical paper abroad, written by Moore, and none in this country, although quite a number of monographs have appeared upon the theory and uses of this remedy, one of the most notable

of which was written by Harrower of London. This perhaps is due to the fact that secretin as such, is a most unstable organic compound and the method of administration had been in dispute.

Bayliss and Starling have contended that therapeutically secretin has little or no value when administered by mouth and should be given intravenously. But I do not agree with Bayliss and Starling in their assertion that secretin has no value when given orally, and though their theory may open to us a most valuable adjuvant in the treatment of glycosuria when given by the intravenous method, as yet I have not been able to obtain a preparation of secretin which would be harmless and sufficiently stable when given intravenously to warrant such a procedure.

I have had prepared at the laboratory a preparation of secretin made from the duodena of hogs for oral administration.

Secretin has not as yet been standardized so that we are unable to determine exactly the correct dosage though we are able to arrive at a fair estimation of the activity of any preparation by the amount of pancreatic secretion we are able to excite, after the Huston method, when so many c. c. of the preparation are used.

The acidity of the gastric chyme is one of the main factors in digestion and the accurate determination whether its production is increased or diminished is vital for a thorough knowledge of the functional disturbances encountered in the many disorders of the intestinal tract.

We know that the pancreas and secondarily the liver, depend upon the hormone or chemical messenger secretin for the initial stimuli required during digestion. Now should the formation of secretin cease or become impaired, many of the complex

metabolic changes in the pancreas and liver that heretofore have been enigmatic may now readily be explained.

This chemical and physiological fact, I have followed in the treatment of the cases herein briefly outlined. The accurate knowledge of each patient's alimentary tract is always required which we obtain by a complete chemical analysis of the gastric contents and whenever possible of the duodenal secretions, the urine and feces, combined with a thorough radiographic examination of the stomach and intestines.

Then from our finding, we are able to determine whether secretin is indicated or not. In such cases as stenosis of the pylorus and duodenum, gastroenterostomy, short circuiting of the intestine, resection of the colon, intestinal stasis, pancreatic insufficiency, hypertrophic cirrhosis and fat metabolism, secretin is undoubtedly of benefit.

The following cases are of special interest, since they demonstrate the peculiar potency exercised by secretin:

*Case I.* Mrs. K., age 35; about one year ago a gastroenterostomy was done for a severe stenosis of the pylorus with removal of the gall-bladder; patient's weight at time of operation,  $103\frac{1}{2}$  lbs. Stomach was dilated, food delay 72 hours; hyperacidity; vomiting daily five to twelve times; urine high specific gravity; over three per cent. urea; trace albumen. Operation was successful but the patient did not seem to respond though the vomiting ceased. Stools continued clay colored and the high urea output still kept up. Fifth week after operation, began giving secretin, continuing its exhibition for seven months with a constant perceptible improvement in the patient. The stools became normal in color at the end of the second month, weight gradually increased until  $122\frac{3}{4}$  lbs. was reached and the urea is now normal, averaging about one per cent.

*Case II.* Miss F., Morristown, N. J., referred by Dr. A. J. Quimby, age 62, diagnosis: pyloric stenosis with chronic intes-

tinal stasis, food delay 104 hours to 128 hours, hyperacidity, duodenal contents not obtainable. Urine: faint trace albumen. Unable to eat a normal meal, could retain only a small quantity of food at one interval. Loss of weight, 17 lbs. Suggested secretin and paraffin oil—at the end of the fifth month a gain of 11 lbs. was recorded, no hyperacidity observed and the food delay was shortened to between 50 and 60 hours. A most gratifying improvement.

*Case III.* Dr. F., New York, age 47, weight 192 lbs., a very interesting case of pancreatic insufficiency. Food delay, 62 hours, stomach dilated; duodenal adhesions and marked colonic stasis; stomach contents normal, blood normal, feces normal. Urine high in urea, nearly 4%, otherwise normal. Complained of malaise, severe pains in legs with great muscular weakness and loss of ambition. This condition had been progressively getting worse for over five years. Suggested secretin, which had been daily continued for nearly six months with a complete subsidence of all symptoms, the food delay dropping to 28 hours and the urea percentage remaining around one. The high urea output in these cases is the chemical index of faulty pancreatic response in breaking down the proteid radical which is reflected by the liver when the excess of ammonia is changed therein to urea, and the colonic stasis, whether primary or secondary, enables protein as such, to be absorbed by the system in excess which will give these unpleasant symptoms. The power of secretin to stimulate peristalsis, the bile secretion, and succus entericus is clinically well exemplified.

*Case IV.* Mr. G., Pittsburgh, Pa., age 45, weight 144 lbs., cirrhosis of the liver. Marked gastric disturbances, blood pressure, 105 m. m. mercury. Wassermann positive; food delay 46 hours; no apparent colonic stasis; urine: urea very low, four-tenths %; trace albumen; no casts; blood normal except hemoglobin low, 70%. Exhibited secretin with anti-specific treatment, (patient refusing salvarsan, having had one injection) for three months, gastric symptoms ceased, urea output became normal, weight increased to 154 lbs., and the constipation ceased.

This case is cited to show that the liver was stimulated to greater activity as indicated by the increase from a low urea to a normal production.

In pancreatic diabetes, my results with secretin so far have shown no clinical encouragement worthy of special consideration; this may be due to the fact that the cases selected were advanced ones, or perhaps the action of additional secretin was of no apparent avail in stimulating the pancreas, although in every case the low urea output was increased to normal and the chronic constipation so difficult to regulate was in each instance overcome; the percentage of sugar however, remained unchanged.

Still I am confident that when our knowledge of secretin becomes greater, a method of administration will be discovered which will warrant our most optimistic, theoretical belief in its therapeutic importance for the diabetic. When dogs are phloridized, producing an artificial pancreatic glycosuria, and small quantities of a freshly prepared secretin solution are given intravenously the sugar disappears from the urine.

Secretin is indicated in:

1. Pyloric stenosis.
2. Pancreatic insufficiency.
3. For hepatic stimulation and cirrhosis of the liver.
4. To stimulate peristalsis in colonic stasis.
5. In gastroenterostomy and short circuiting of the intestine.

**In Conclusion.**—Secretin will enable the internist to successfully combat many of the complex disorders due to the abnormal functioning of the pancreas, and as our knowledge becomes more accurate regarding the laws of the internal secretions and their activators, I am positive that secretin will take one of the foremost places in the advanced therapy of today.

17 East 38th St.

## SOME REMARKS ON THE FUNCTIONS OF THE THYROID, THE SUPRARENAL, AND THE PITUITARY GLANDS.<sup>1</sup>

BY

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The functions of the ductless glands have, in recent years, received much attention from numerous investigators, and as a result of such investigations we have had placed in our hands some potent and extremely useful remedies. Now-a-days in the prevention and treatment of disease we are coming more and more to recognize the advantage of developing and efficiently maintaining the normal functions of the body, and, in the case of infectious diseases, of establishing immunity, or at least of increasing the patient's resisting power to the ravages of each disease, thus stimulating his innate powers of recovery when attacked, rather than by the ancient method of attacking the disease with the Pharmacopeia and all its paraphernalia. Drugs, of course, are not without their uses especially if mixed with a considerable amount of faith, and many of them have this advantage that, if judiciously administered, they cannot do much harm.

The power of adaptation to the environment and the inherited power to resist the encroaches of any particular disease vary enormously in different races and in different individuals of the same race. The acquisition of the use-acquirement against any disease whether obtained by the per-

<sup>1</sup>Address given at the Hull and Bradford Medical Societies.

sonal experience of the individual or inherited from the experience of the race, is always materially aided by the proper function of the ductless glands. The cretin, where the function of the thyroid is in abeyance, is a very susceptible prey to tuberculosis. In Addison's disease not only is tuberculosis usually the cause of the abolition of the functions of the suprarenal glands, but the patient, when he does not die from exhaustion, readily falls a victim to any acute infectious disease. Where the pituitary is inactive we get a condition of infantilism.

The secretions or active principles of the ductless glands, about which I am going to speak tonight, are very powerful for good or evil accordingly as they are or are not appropriately used. A friend of mine on returning from a medical congress in America spoke in high terms of the brawny and sinewy medical men of the West, but said he would not care to see them handling some of the more lively drugs of the Pharmacopeia. So with the thyroid, suprarenal and pituitary extracts I would advise, before administration, a clear conception of their suitability for any particular case. There is still much work to be done not only in further investigating the functions of each particular gland, but also in determining the correlations of their functions and their mutual interdependence.

When we get a gross lesion with marked perversion of the function of any of these glands, then the picture portrayed is so coarse that he who runneth may read, but a true artist does not require a pot of paint thrown in his face in order to discern the finer lineaments of the picture. There are numerous degrees of alteration of function so one should not wait to see the grosser manifestations of

disease, but be prepared to deal with the slightest variation from the normal. In each of these glands there may be an excess or diminution in its functions, or a diminution in one with over activity in another, and what is really normal may be often difficult to determine.

**Thyroid Inadequacy.**—Our knowledge of the functions of the thyroid gland was, to a large extent, primarily obtained by meddlesome surgery, and from the observations of Gull on a cretinoid condition arising in adult women, and from the investigations of Ord in this disease which he designated myxedema; the interest in the affection rapidly increased when it was found to be very amenable to treatment. Victor Horsley and others proposed thyroid grafting and soon afterwards George Murray and Hector Mackenzie discovered that the injection, and oral administration of thyroid extract rapidly cured the disease.

Well marked cases of myxedema are not very common in the present day, because the disease is easily recognized and thyroid treatment soon restores the patient to a more or less normal condition. In advanced cases the individual is slow in thought and speech, all his mental faculties are at a low ebb, he is neither alert in body or mind, his movements are executed in a slovenly manner, he seems more fitted for a condition of hibernation than for the normal activities of life.

Dr. Murray says that myxedema is seven times more common in females than in males, and this would seem to be due to the fact that overaction, which is so common in females, is apt to be followed by lessened function. Moreover, as women approach the menopause the thyroid usually becomes less active; at this period of

a woman's life the regular use of small doses of thyroid will be found very beneficial. Though marked cases of myxedema may not be so common in males, I am convinced that atypical cases are much more common. In males the thyroid is less active but the pituitary and suprarenal glands are much more so, hence the blood pressure is higher, there is more retention of calcium salts, and arteriosclerosis occurs earlier, and in a greater degree. Slowness of speech and thought and defective play of the expression are due to deficient function of the thyroid with lessened calcium metabolism and such conditions are often more noticeable in men than in women. I have recently seen two men with a stolid expression, slow in thought and speech, monotonous in voice, defective metabolism, dry skin and high blood pressure. These conditions, though ascribed to the effects of a railway accident, were, in my opinion, undoubtedly due to thyroid inadequacy and I gave a favourable prognosis.

Leonard Williams has shown the great value of thyroid in the incontinence of urine in children, and I have found it of great use in troublesome micturition in the aged. Blair Bell has found it of value in cases of mastodynia, and I have seen hard nodular masses in the breast due to mastitis disappear under the use of decalcifying agents and thyroid. I have also found such a combination extremely valuable in cases of large prostate. Whenever you wish to increase the calcium metabolism, thyroid extract is of importance, hence its value in arteriosclerosis and hyperplastic conditions. The action of iodine in such cases is chiefly effected by its stimulating effect on the thyroid gland.

**Hyper-Thyroidism.**—Exophthalmic goitre, is now, I think, almost universally

acknowledged to be due to excess of function of the thyroid gland. When you get a case of marked exophthalmos, a large pulsating thyroid, tachycardia, general nervous trepidation—the patient in an apparent state of fright, emaciation, a moist skin with consequent lessened electric resistance, any fool can tell you what is the matter, but there are an enormous number of cases of hyperthyroidism where there is no exophthalmos, no apparent enlargement of the thyroid, and no pronounced nervous symptoms. However in these cases an intelligent observer will readily detect a tendency to emotional and vaso-motor disturbance, a warm moist skin, warm extremities, active capillary circulation, rather high venous pressure, rapid action of the heart and the rate easily increased by any mental excitement, the knee jerks and all the deep reflexes increased, and slight muscular tremor may be appreciable. In all degrees of hyperthyroidism the urine may contain a slight amount of albumin especially after getting up—this corresponds to the so-called albuminuria of adolescence and is associated with deficient vaso-motor tone and a lessened amount of fixed lime in the blood. The free lime in the blood may or may not be increased but there is always an excessive excretion except when there is a very small intake. In cases of hyperthyroidism there is a state of unstable equilibrium; the individual is sharp, alert, even vivacious, but easily exhausted both mentally and physically and is incapable of sustained effort.

The causes of the thyroid taking on this over action, beyond the necessities of the system, are still rather obscure. This over action cannot have any necessary connection with the condition of the water in goitrous districts because the large fibro-cystic masses are associated with lessened

function of the gland, though of course in many such cases there may have been a primary excess of function and we know that many cases of exophthalmic goitre end in myxedema. However this may be many are of opinion that the cause is water borne and can be destroyed by boiling, but the proof adduced in support of this contention is far from conclusive.

We do know that the active principle of the gland contains iodine, and that excess of function of the thyroid is always associated with excess of iodine in the gland. I have seen two cases of exophthalmic goitre, including well marked exophthalmos, produced by a prolonged use of the tincture of iodine, and both cases were rapidly cured by stopping the iodine and placing them on a calcium mixture. There may be sources of iodine difficult to trace in individual cases, but in every case one should keep his faculties of observation alert, try to find out the cause and remove it. In every case the urine should be examined for iodine. Many medical men will tell you that they prescribe iodine and thyroid in such cases with advantage, but on what grounds I cannot say, unless it be a bit of the hair of the dog that bit you, or the homeopathic doctrine that like cures like, and in that case the more infinitesimal the dose the better. It may, however, most likely be that in such men's minds there is a confusion between over-action and under-action, exophthalmic and fibro-cystic goitre.

In some cases there seems to be not only over-action of the thyroid but diminished action of the suprarenal glands with dark pigmentation of the skin and low blood pressure. This adds to the gravity of the case though the thyroid symptoms are not more pronounced. With the low blood

pressure there is less cardiac stimulation and less palpitation.

The blood pressure in exophthalmic goitre is very variable and merits special consideration. There is less peripheral resistance, the viscosity of the blood is diminished, the capillary circulation is active and free which tends to lower the arterial pressure, but on the other hand the capillary and venous pressures rise, the supply of blood to the heart is free, the ventricular cavities are large and the systolic output great; so the systolic pressure is fairly high, but as the arteries are large and the peripheral resistance low there is a great fall in the pressure gradient with a relatively low diastolic pressure. This great difference between the systolic and diastolic pressures means an inefficient circulation; it is therefore important that vascular tone should be maintained, and it is by this means that suprarenal extract plays an important part in treatment.

Though for very many years I had frequently prescribed lime salts in exophthalmic goitre, it was the observation of Blair Bell that the thyroid secretion exerts a powerful influence on calcium metabolism which led to my systematic employment of calcium in this disease. I now think that the soluble salts of calcium especially when combined with adrenalin, constitute our best remedy in hyperthyroidism. The suprarenal and pituitary secretions help to retain the lime salts in the tissues, but the pituitary should only be used when the blood pressure is low, and where there is reason to believe that the suprarenal glands are inactive.

As a rule these patients absorb lime very readily and excrete it very freely so that there is rarely sufficient in the blood and tissues, and this is one of the difficulties

we encounter in treatment. I have found that retention of the lime salts in these cases is materially assisted not only by adrenalin, but also by the free use of sodium chloride in the diet. The blood should also be kept very alkaline as thus the lime salts are readily thrown out into the tissues. In these cases table salt can be allowed with impunity as there is rarely any tendency to edema. On the other hand in many cases of rheumatoid arthritis where the fibrous tissue is much swollen it is often important to lessen the intake of sodium chloride.

As the patient begins to improve the amount of lime in the urine diminishes, even when the patient is taking the same amount of calcium in his food and medicine. As the improvement advances any albuminuria that was present disappears. We may eventually find that there is too much lime in the blood and tissues, the heart's action becomes slower, and often markedly irregular and intermittent, and the arterial blood pressure high. However, we must not then increase the calcium metabolism with iodine and thyroid, but simply lessen the intake and hasten the elimination with phosphoric or citric acids. For the contraction of muscular fibre, both striped and unstriped free calcium ions are essential, but the supply, if continuous, need not necessarily be great; the rapid metabolism of calcium which takes place in hyperthyroidism lessens the free calcium ions, and may even attack the fixed lime which is linked on to the protein molecules. We are thus apt to get in this condition heightened irritability of muscles, less efficient contraction, and want of muscular tone. As a consequence the deep reflexes are increased, there may be general muscular tremor and fibrillar contraction, the patient is alert but easily fatigued, and the heart

may be dilated. If the suprarenal glands are fairly active these effects of hyperthyroidism are correspondingly balanced.

With the rapid heart's action and increased metabolism there is great oxidation often with extreme emaciation. I have recently seen a very severe attack in an adult male patient whose loss in weight was about five stones, but he made a good recovery and put on more flesh than he lost. In such cases there should be absolute rest in bed, no mental or physical excitement. The diet should be liberal and consist chiefly of milk, farinaceous foods, unsaturated fats, and white meats. There should be no acids or acid fruits, and as there is often a certain amount of carbohydrate intolerance with slight glycosuria, it is well to avoid sweets and sugar.

Where there is much muscular wasting there is an excessive excretion of phosphates, and it is then well to prescribe a combination of glycerophosphates of calcium and potassium. The patient can also freely use the phosphate of sodium and if there be any tendency to edema this may be substituted for table salt.

**Sex.**—The disease is much more common in females than in males, and is especially liable to occur during the active menstrual period, though I have seen some very severe cases after the menopause. In cases of hyperthyroidism there is rather frequent and free menstruation which is at least associated with free calcium metabolism. In amenorrhea there is not only defective thyroid secretion, but also deficient lime salts in the blood, whereas in dysmenorrhea the thyroid inadequacy is usually associated with excess of lime salts. In both cases thyroid extract is useful, but in the first a liberal allowance of lime salts should also be given, and perhaps the best salt in such cases is the iodide of calcium.

In dysmenorrhea decalcifying agents are often useful.

The thyroid gland is as a rule much more active in the female than in the male, and plays a very considerable part in the characteristics of the two sexes. The female is sharper witted, more volatile and less stable. A woman often jumps to a conclusion without any process of reasoning but simply by intuition she gets there, sticks there, and no process of reasoning will convince her that she is not right. The thyroid metabolism has much to do with this process; women of the more reasoning type have their suprarenals as well or perhaps more developed than their thyroids, and present other masculine characteristics.

Sometime ago I said if one wants to think quickly, speak quickly, and act quickly he had better not have too much lime in his nervous tissue, but on the other hand for stability and tenacity of purpose a certain amount of lime is necessary. Women are not so liable to arteriosclerosis as men because they eat less, are more temperate in all things, and do not lead such a strenuous existence. Moreover, the thyroid gives rise to active calcium metabolism, the blood pressure is lower, and as Blair Bell has shown they get rid of a good deal of calcium at each menstrual period. When arteriosclerosis does arise in women, apart from kidney disease, it chiefly occurs in those who have borne large families, who have had long continued high arterial tension with calcium retention. Emotional disturbances frequently occur in women, and emotion acts like suddenly turning a stop-cock in a water pipe connected with the main; it sets up waves of pressure the chief stress of which is thrown on the aorta. In such cases aortic dilatation is very common. In the early months of

pregnancy the thyroid is active as a rule and so we get rapid calcium metabolism, and an extra supply of lime salts may be demanded to correct headaches, and other disturbances. A typical case of exophthalmic goitre occurring in pregnancy requires very careful treatment, and at parturition one should always have a hypodermic injection of pituitary extract ready to check hemorrhage.

Cases of hyperthyroidism are much more difficult to treat than the opposite condition of hypothyroidism, hence the surgeons, anxious to occupy every field where there is work to be done or a fee earned, have stepped in and have told the physicians that if you cannot lessen the excessive function of the thyroid we will soon do so by cutting a half or three-fourths of the gland away. They confess to having formerly over-stepped the mark and to having produced cachexia thyropenia, but now they say we will leave sufficient amount of the gland to carry on normal function. This seems all very nice and plausible and some surgeons claim to have had a large measure of success, but unfortunately it is not all success, and we hear more of the successes than of failures. A good many years ago I saw several deaths after operation, and I then made up my mind that in future I would not be a *particeps criminis*. Since then I have not seen any deaths from this disease though I have seen a good many severe cases. Dr. C. H. Mayo, who has performed more of these operations than any other surgeon, with the exception perhaps of Kocher, has recently stated that "while an exophthalmic goitre was amenable to surgical treatment by the removal of a large part of the hyper-secreting gland, this procedure must not be considered emergency surgery. During exacerbations all

cases should be considered medical. Surgery is indicated during the upward wave of improvement." Why interfere surgically or otherwise with an upward wave of improvement?

Antithyroid serum, thyroidectin, rodagen have all been highly extolled, but they are all very expensive remedies, and personally I have not been much impressed with their value. Belladonna is supposed to lessen the secretion; digitalis has not much effect in lessening the frequency of the pulse, though it is useful where the heart is dilated and blood pressure low, but in such conditions I prefer small doses of pituitary extract. The X-rays have an effect in lessening the function of the gland, and the continuous current has occasionally been found useful. The remedies on which I most rely are the calcium salts, and the suprarenal gland.

Dr. Blair Bell has shown the marked correlation which exists between the thyroid gland and the ovaries. He says the thyroid and the pituitary in association with the ovaries are the factors most concerned in the final development of the female genital organs. "Thyroid or pituitary insufficiency may cause the genital organs to remain infantile. Removal of the ovaries in the young sometimes tends to produce adiposity, and almost invariably overgrowth of the skeleton."

The ovarian secretion like that of the thyroid increases calcium metabolism, and removal of the ovaries has been long practised in the treatment of osteomalacia. However, it does not always do to reason from a general result to a particular case as there may be many individual exceptions where other conditions interfere with the usual effect. Dr. Hope Simpson in association with Dr. Blair Bell, recently

recorded a very interesting case of perverted metabolism in a lady both of whose ovaries had previously been removed. This lady's joints were almost flail-like so that she could not stand owing to relaxed ligaments due to deficiency of lime. Under the use of pituitary extract and lime salts she made a perfect recovery.

**Supra-renal Glands.**—Professor Ernest E. Glynn has shown that hypernephromata of the adrenal cortex in the case of females have caused the development of male characteristics, such as hirsutes, enlarged clitoris, the male type of breast, atrophy of the uterus and cessation of menstruation, and a deep harsh voice. In the case of male children hypernephromata give rise to precocious puberty.

I found out twelve years ago that in cases of pleural effusion after the abstraction of the fluid the injection of a drachm of adrenalin solution, 1 to 1,000, into the pleural cavity prevented the reaccumulation of the fluid. I soon afterwards found out that it also encouraged the formation of adhesions, and then in addition, to prevent the adhesions and any collateral hyperemia of the lungs, I also injected filtered air and sterile liquid paraffin. The introduction of air to the pleural cavity enables one to draw off the whole of the pleural effusion without causing the patient any discomfort and without the slightest risk of pulmonary edema. This is an especially valuable method of treating tubercular pleurisy; it prevents the spread and rapid development of the tubercular mischief which not infrequently follows the ordinary abstraction of fluid in such cases. Air has the advantage over oxygen in these cases in that it is composed of four-fifths nitrogen which is only slowly absorbed.

We are all aware of the powerful ef-

fects of adrenalin in contracting the smaller blood vessels and thus checking hemorrhage. According to Oliver and Schäfer, Elliott, Brodie and Dixon adrenalin only acts on unstriped muscular fibre which is innervated by the sympathetic, and by its action on the nerve endings it serves as the link by which the functions of these nerves are exercised. The effects of this secretion on any particular organ depends on the function of the nerves which it stimulates. In the case of the small arteries supplied by vasomotor nerves we get contraction, whereas when we get inhibitory or dilator nerve fibres we may have dilatation; when applied to the bladder of the cat we may have dilatation of the fundus and contraction of the sphincter.

Dr. Oskar Klotz experimentally demonstrated in corroboration of the previous work of Dr. Josué that the intravenous injection of adrenalin led to degeneration and subsequent calcification of the media of the arteries. He also suspended rabbits by the hind legs for a few minutes daily and thus brought about advanced lesions in aorta. In this connection it is worthy of note that the calcium index in rabbits is usually high, and in the human being the arteries of the lower extremities, which are ordinarily subjected to the highest blood pressure, are most prone to arteriosclerosis.

I have shown that although we may not be able to regulate the secretions of the pituitary and suprarenal glands, we certainly can control the high pressure effects which they produce. We can lessen the intake of lime and hasten its elimination by decalcifying agents. Moreover we can stimulate or add to the secretion of the thyroid gland which increases calcium metabolism and lowers the blood pressure.

**Supra-renal Inadequacy.**—A typical case of Addison's disease presents a picture which cannot be easily effaced. It arises from disease or atrophy of the supra-renal medulla. In the majority of cases the mischief consists of caseation of tuberculous origin, but it is not amenable to tuberculin treatment. Unfortunately the small but continuous supply of adrenalin which is necessary to maintain the function of the sympathetic cannot be easily met by any extraneous supply as the natural and synthetic products are readily oxidized and cannot be universally distributed to all the sympathetic nerves. Consequently the administration of the glandular extract is found to be of very little use in Addison's disease. I generally prefer a mixture of pituitary extract, adrenalin, thyroid and calcium iodide. In my opinion if we wish to get a very widely distributed effect of adrenalin it should be administered in a very dilute form with a large quantity of a hypertonic saline solution of sodium and calcium chloride.

I saw recently a typical case of Addison's disease in a young man whose skin and mucous membranes were deeply bronzed, his extremities cold, blood pressure very low, the muscles of the lower limbs were fairly strong but of the upper extremities weak and the power was poorly sustained; there was considerable emaciation. He had been a Rugby footballer and thought he could still take his part in a scrimmage, but when I got him to stand up to test his vital capacity he had just blown 100 cubic inches when he suddenly stopped and fell in a faint at my feet. Notwithstanding his condition he is engaged to be married, and has been working very hard to better his position so that he may be able to do so. Evidently the suppression

of the suprarenal function is not incompatible with sexual desire, but I should think it would be with sexual capacity.

In diphtheria there is lessened function of the suprarenals, and I think also in many cases of pneumonia and some other infectious diseases.

**Pituitary Hyper-secretion.**—As has been shown by Harvey Cushing and many others the anterior lobe of the pituitary gland seems to be associated with skeletal growth, and the same may be said, though in a more limited degree, of the thyroid. Where there is excessive action of this portion of the gland in early life we get gigantism, and when it occurs at a later period after the epiphyses have become ossified we get acromegaly. This excess of function is also associated with increased sexuality in the male, and, according to Blair Bell, with amenorrhea in the female. Excessive action of the infundibular portion leads to increased metabolism and carbohydrate intolerance with the appearance of sugar in the urine, and in this respect adrenalin has had an even more powerful effect. Hyperpituitarism also causes high arterial tension, vascular degeneration and calcium retention. Blair Bell and Pantano Hick have demonstrated the marvellous effect of the infundibular extract in producing contraction of the intestines and uterus. We are also much indebted to Dale, Schäfer, Harvey Cushing and many others for our knowledge of the actions of this secretion.

In the so-called sapremia, which now infrequently occurs after parturition, it has an admirable effect in keeping the uterus firmly contracted and thus shutting out further septic absorption. It is also very useful for the low blood pressure and paroxysms of the bowel which frequently occur in pneumonia. In diphtheria a combination of

pituitary extract, adrenalin and a calcium salt is often very useful in rectifying the low blood pressure and dilated heart which frequently occur in this disease. In cases of neurasthenia with a dilated stomach and cold extremities a mixture of thyroid and pituitary extract is very serviceable. Pituitary and adrenalin from their effects on calcium retention are of advantage in osteomalacia.

**Pituitary Inadequacy.**—Defective action of the anterior lobe is a cause of infantilism, and if associated with hypothyroidism there may be also a cretinoid condition. When there is deficient action of the infundibular portion there is great carbohydrate tolerance and low blood pressure associated with such conditions as dystrophia adiposis genitalis, or Dercum's disease—adiposis dolorosa. In the treatment of cases of pituitary deficiency by the use of the extract we are easily guided in its employment and dosage by the blood pressure and the freedom of the urine from sugar.

The careful study of the functions of these glands will well repay every thoughtful practitioner.

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## THE BYWAYS OF THYROID INADEQUACY.

BY

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If you will leave the high roads of thyroid inadequacy, as represented by myxedema and cretinism, to wander inquisitively amongst the byways and hedges, you will not want for curiosities, and there will

be thorns in plenty. The thorns will be provided by the sceptical pin-pricks your observations will receive by those curiously incurious and sedulously incredulous people who slowly strut the streets of platitude. The curiosities are full both of interest and significance. To some of them I now venture briefly to direct your attention.

In the selection of its point of attack thyroid insufficiency is even more capricious and elusive than arterial degeneration. If you look no further than the skin and the dermal appendages, its classical lair, it will evade you as certainly as arterial degeneration will escape you, so long as your gaze is restricted to the aortic arch. There is no tissue which may not be attacked by thyroid insufficiency, and scarcely a symptom which it may not provoke. Instead of being obese like the typically myxedematous, the subject of thyroid inadequacy is often thin, emaciated even. In place of the hairlessness which according to the text-books you are entitled to expect, you will not infrequently find a condition approaching hirsutes. And this is the explanation.

The thyroid secretion is one of our main defences against toxic invasion. In any long struggle against chronic intoxication the gland becomes depressed, and signs of inadequacy appear. If the original intoxication should happen to be one which naturally leads to loss of flesh, and the struggle between the intoxication and the thyroid defence has been protracted, you find yourself in the presence of a patient who is both emaciated and subthyroidic. The commonest cause of such an intoxication is chronic intestinal stasis. In the earlier stages, the thyroid is stimulated and the invader is kept at bay. As time goes on, the attacking array, re-inforced by

daily accumulations, gains upon the isolated defensive thyroid, and the latter flags. It bends, but it does not break. It becomes inadequate, but it does not strike. The thyroid gland is a gentleman who will fight to the end. But long before the end comes, long before mucin is deposited and hirsute appendages are lost, the patient will seek your advice. If, undeterred by the absence of mucin and the presence of plenty of hair, you look at him with a seeing eye and read the inadequate thyroid, you will probably attribute the stasis to the inadequacy, and not the inadequacy to the stasis. Of all things in medicine, chronic constipation ought to be the easiest of diagnosis. But it is not. There are hundreds of people who have a regular daily evacuation, who are nevertheless walking septic tanks. These tanks are terrible depressors of the thyroid, and unless you empty and disinfect them, your correct diagnosis of thyroid inadequacy and its logical consequence of thyroid therapy, will avail you nothing. Your patient may become mildly mental. One day he will die, you will not know what to put on his certificate, and you and your treatment will be discredited.

And the other aspect of the sphere is there to baffle you. Many, indeed most, subthyroidics are constipated. The constipation may be so blatant and obtrusive as successfully to conceal the thyroid inadequacy even from the practised eye. You may give purgatives and laxatives, glycerine enemata and oleaginous douches; you may belt your patient, and though you may temporarily relieve, you will never really cure the stasis until you have recognized and treated the thyroid deficiency.

There are patients, who, though on the lean side and hirsute in a high degree, are nevertheless strikingly deficient in thyroid.

This represents the aftermath of a chronic toxemia, more or less successfully overcome. An old tuberculosis is a common cause; less common, though not infrequent, is neglected or unskillfully treated syphilis; intestinal stasis I have already mentioned. During the protracted struggle against the toxemia, whatever it may be, the irritated thyroid performs its task of nullifying the poison, but incidentally it produces its physiological effect of stimulating the hair follicles all over the body. When you strip your patient an Esau is revealed to you; a lethargic and often garrulous Esau who has many of the stigmata of thyroid inadequacy. For though he has won his battle against, say, tubercle, he has done so at the price of an overstimulated and therefore exhausted thyroid gland whose meagre tribute to the economy is now insufficient to protect him against symptoms. He will complain to you of various subjective phenomena; his spare figure and hirsutic embellishments may lead you to dismiss any suspicion of thyroid complicity. Beware of so doing.

A patient with a partially acting thyroid may thus, contrary to expectation, be both spare and hirsute. Of the other two classical signs of almost complete thyroidlessness, namely a slow pulse and a subnormal temperature, the former may be absent; the latter never. Though a slow pulse is undoubtedly the rule, a normal rate is common, and you need never be surprised to find a quick one. A pulse rate of over 100 used at one time to deter me from prescribing thyroid extract. It never deters me now. But this it does do, it reduces my initial doses to a very low figure. In such cases it is to be supposed that there has been a deposit of mucin in the cardiac musculature, which, if it is to be removed

with safety, must be removed gradually. However this may be, I have often seen a quick pulse become normal and even slow, in response to carefully graduated doses of the extract. As Hertoghe puts it, "*Le suc thyroidien est la digitale physiologique.*"

I have said that a low temperature is never absent from these cases. And the subjective chilliness is often more pronounced than the objective. The patient will tell you that she never feels warm except in a hot bath or when well ensconced in bed with an eiderdown and several hot bottles. When the husband is not subthyroidic, difficulties are apt to arise. Of continued hypothyroidism, that is true. But it is not true of those curious cases of what the French call dysthyroidism, in which the sleepy thyroid ever and anon awakens to indulge in a veritable debauch of secretory energy, to drop silently and sullenly to sleep again. These cases are a law unto themselves, not only in the matter of temperature, but in many other respects. But in continued hypothyroidism the temperature is always low. In pronounced cases it falls to 95° F., or even lower, and there is usually a very decided drop between midnight and 5:00 a. m. This probably accounts for some at any rate of the cases of nocturnal enuresis which I have elsewhere described.<sup>1</sup> The late afternoon is generally a bad time. This may account for the pernicious practice of afternoon tea.

In this connection, let me be allowed a digression. Some of us are not infrequently accused of seeing hypothyroidism where it does not exist. If, it is said, all the people who are described as such were really sub-

<sup>1</sup> "Adenoids, Nocturnal Enuresis of the Thyroid Gland." (John Bale, Sons and Daniels' Son, Ltd.)

thyroidic, then full one-third of the population of Northern Europe would have to be included in the category. Now, a visit to any hospital in the region mentioned, paid with a view of scrutinising the temperature charts, will reveal the fact that a very large percentage, especially in female wards, of the patients who are said to have normal temperatures, surgical cases and the like, have in point of record, temperatures which are definitely subnormal. Thyroid insufficiency may not be the only cause of continued subnormality, but it certainly is the chief cause. It follows therefore that either these substantially normal people are subthyroidic, or that the generally accepted normal of 98.4° F. requires revision. Very little further investigation will satisfy the observer that most of these patients have other evidences of thyroid insufficiency, so that the above quoted figure of one-third, suggested in derision, is in reality not very far from the truth.

The old lady who assured her pastor that she had found much comfort and support in that blessed word "Mesopotamia," has numerous counterparts in the thousands who now find much diagnostic satisfaction in the word "neurasthenia." I once wrote a paper on neurasthenia. It is many years ago, and I have never had the courage to re-read it. I know I was very much in earnest, and sincerely believed that I was dealing with something which had a real existence. I am now profoundly convinced of the contrary. That the nervous system becomes exhausted is a truism to every clinician. That it becomes exhausted to the point of producing mental and physical wreckage, for no better reason than over-work or idleness, or introspection, is a proposition to which I cannot however sub-

scribe. The term neurasthenia has become a mere cloak for loose diagnosis. It seems to be a highly decorative and acceptable cloak which patients don with such manifest satisfaction that the physician may be pardoned if he tenders it too frequently. But even if we restrict the term to the condition carefully, but all too vaguely, described by the authorities, it is impossible to avoid the conclusion that this curious ragout of subjectivities, served with appetising slices of qualifying adjectives, has no right whatever to be called a disease, any more than pain or albuminuria can properly be so described.

Exhaustion of the nervous system recognises many causes. The diagnosis is made when the cause has been discovered, but not until then. Rest, massage, and stuffing may do good; I am credibly informed that they do; but that does not alter the fact that such treatment indiscriminately applied to all cases of nervous exhaustion is abominably and outrageously empirical. The causes usually cited are eyestrain (alas! how seldom diagnosed); trauma; the acute specifics, especially influenza; chronic intoxications, such as syphilis; sexual abuse and other indulgences; but I have never yet seen thyroid deficiency so much as hinted at. And yet if you will compare the description of neurasthenia in any textbook with your recollection of the subjective nervous phenomena in pronounced hypothyroidism or mild myxedema, you will observe a remarkable resemblance. Nor, need you be surprised. Mucin deposited in the area of the central nervous system—and it may be so deposited without any definite external suggestion of its presence—will give rise to irritable weakness and other features which characterise nervous exhaustion. In cases which have been

grandiloquently labelled neurasthenia, if you will look for signs of thyroid inadequacy you will not infrequently find them, especially in the middle aged.

*"Si le bon Dieu n'exista pas, il faudrait l'inventer."* If the word "rheumatism" had not been handed down to us by diligent forefathers, it would have been necessary to coin it. A priceless shield and buckler to the fencing physician, it is burbled with pious contentment by the suffering, but satisfied patient. The victims thereof are drenched with salicylates and iodides; they are sent to spas to be bombarded by the doucheur and spanked by the masseur; they are subjected to electrical ecstasies and suffer Zander contortions; they are cataphoresed, vaccinated, serummed, radiumed and dieted, with results which vary from the sublime to the pathetic. If there be a common denominator in all this diagnostic and therapeutic chaos, it has never revealed itself to me. I am content to restrict the term rheumatism to the acute articular variety, which has some curious, but as yet obscure, relation to thyroid activity. Of the many chronic forms of arthritis which produce more or less deformity, I am not at present concerned to say more than that, with the very definite exception of the gouty, which are always subthyroidic, very few of such cases have seemed to me to be in any way causally related to thyroid insufficiency. With socalled muscular rheumatism the case is different. This has been very happily rechristened by Sir William Gowers, and its former area enlarged, by the introduction of the term fibrositis, which includes inflammation of white fibrous tissue wheresoever this normally exists; that is to say, in aponeurosis, fibrous septa, the sheaths of muscles, the sheaths of nerves, peri-

osteum and the fibrous structures surrounding the joints.

Now if it be remembered that mucin confers its favours with a combination of brutal impartiality and feminine caprice on every kind of tissue, sometimes attacking all, at others selecting one only, it will surprise no one to find that such deposits occur in the white fibrous tissue above mentioned, and that fibrositis, myalgic, neuralgic and aponeurotic, is not infrequently associated with definite manifestations of hypothyroidism in other parts. Intractability to ordinary remedies should always arouse suspicion of the adequacy of the thyroid secretion. I have more than once succeeded in relieving severe suffering of long standing by giving heed to this suspicion and acting upon it, thereby evoking overwhelming and even embarrassing gratitude. Parenthetically, however, I may be allowed to remark that persistent "rheumatic" pains have proved to be associated even more often with the Argyll-Robertson pupil and absent knee jerks than with evidences of thyroid inadequacy. The pain of this nature which is most typically subthyroidic in origin is backache. It is generally referred to the sacrum, and is liable to be very intense. It is often worse at night, and frequently forces the sufferer from his bed towards 5:00 a. m. Nervous patients are convinced that it is caused by "creeping paralysis."

Of all occurrences which drive a patient to the doctor, hemorrhage, from what surface soever, and however slight, is surely the most unfailing. Pain, with the aid of aspirin, he will bear; his cold will be treated by the children's nurse; for diarrhea he will apply to his maiden aunt; but blood is a serious matter. The causes of hemorrhage from mucous surfaces are not in

reality very many. Some are of evil omen; others are not. In illustration of the former, may be cited the hemorrhage which first brings to light a chronic nephritis, an arteriosclerosis or any other serious condition associated with continued high blood pressure. In connection with the latter, epistaxis for example, everyone has met with cases which seem to have no obvious significance, and which are quite justifiably dismissed as trivial. Now, hemorrhage is a very frequent accompaniment of definite myxedema, and is by no means infrequent in lesser degrees of thyroid insufficiency.

This fact was first brought vividly before me when an oculist sent me a lady who had had a fairly extensive hemorrhage into one of her retinae. The oculist could find no reason for this, and in his note to me suggested the possibility of renal disease. The appearance of the patient, as indeed is often the case, was such as to give considerable colour to the suggestion. But her blood pressure (about 110 mm. Hg.) was low for her age, which was 55 years; the urine, which was high coloured with a sp. gr. of 1025, was free from albumen and sugar. Having satisfied myself on these points, I pursued the investigation further, and was not long in discovering very definite evidences of pronounced hypothyroidism. Since that time I have had similar experiences with hemorrhages other than retinal, and when enquiring for signs of thyroid deficiency I now make a point of asking if anything of the kind has ever occurred.

Dr. Hertoghe, of Antwerp, whose contributions to the literature of hypothyroidism are amongst the most painstaking, interesting and illuminating in any language, insists that menorrhagia is one of the most constant symptoms of hypothyroidism.

*"En règle générale, l'insuffisance thyroïdienne se traduit par des metrorrhagies, parfois effrayantes. L'administration de la thyroïdine modère les pertes. Si l'on force les doses on peut même faire disparaître le phénomène menstruel."* That is highly instructive; and coming from such a source it must carry considerable weight.<sup>1</sup> It is also easy to remember. What is not so easy to remember is that thyroid inadequacy may be responsible for all kinds of obscure and seemingly sinister hemorrhages, and unless the fact be recalled, their treatment will not be very successful.

And here, I am unable to resist another digression. Thyroid inadequacy, as we have just seen, produces menorrhagia. If reliance can be placed upon two of my cases, pituitary insufficiency causes amenorrhea. The story of one of them must suffice.

A young lady of attractive appearance was brought to me by her mother, in the month of May, 1911. She was 21 years of age. She began menstruating at the age of 13½, and continued to do so painlessly, though not quite regularly, up to the age of 15½. The menses then stopped suddenly, and had never reappeared. The cessation was at first regarded with equanimity by the parents. Gradually, however, they became aware that this physical fact was accompanied by a change in character. The girl's personal beauty had been considerable; she had been bright and coquettish, attractive to young men, and enjoying their society. All this was now changed. Her expression lost its fire and her manner its vivacity. The young men became indifferent to her, and she to them. Her parents became uneasy, and the doctor was called in. Then ensued a perfect orgie of treatment, medicinal, surgical and suggestion, into the details of which it would be

<sup>1</sup>And yet so competent an authority as Dr. Blair Bell, of Liverpool, says "Thyroid insufficiency always causes a decrease in, or the complete cessation of the function of menstruation, according to the degree of insufficiency." Such is certainly not my experience.

painful to enter. Suffice it to say that she suffered rest cures, curettages, aloetic purgatives, glycerine tampons, *et id genus omne* without any result physically, and this result mentally, that she took fright at the very name of doctor. When she was dragged, apathetically protesting, into my astonished presence, she had not seen one for years. For reasons which it is not necessary to specify, I came to the conclusion that she was the subject of hypopituitarism, and prescribed the extract of the whole gland in doses of 10 grains three times daily. This was on May 9th. On August 4th the menses reappeared, normal in every way. She continued the extract, and with it, regular menstruation, until the following June. She was then so well, and had so completely recovered her former alertness and vivacity that her mother regarded her as cured, and suspended the treatment. In August she missed her period; in September she did the same. In October I saw her again, and urged that the pituitary should be recommenced and persevered with. The result was again quite satisfactory, and had continued so when I last heard of her.

The other case is very similar. It is worthy of note that neither of these patients displayed that enlargement of the thyroid which is sometimes said to accompany amenorrhea.

But if hemorrhage is the bogey of the laity, how shall we describe the effect which the discovery of albuminuria produces upon the physician? In its dreaded presence the most optimistic hastily sheds his optimism and gravely assumes the prognostic black cap. Youths have been coddled into hypochondriasis, sound lives have been declined insurance, healthy adults have been condemned to edematous death, for no better reason than the discovery that a normal constituent of the liquor sanguinis occasionally appears in the urine. Some years ago I ventured to raise my voice<sup>1</sup>

against this attitude on the part of the profession, and had the grim satisfaction of evoking the petulant protests of the pundits. Time has served only to deepen my conviction that to take fright at the presence of albumen in the urine is to trouble the waters without bringing the gift of healing.

The bearing of this upon the question which now concerns us is that albuminuria is not only the rule in myxedema, but is very frequent in minor degrees of thyroid insufficiency, and an interesting point in this connection is that the albuminuria in such cases is largely orthostatic. The morning specimen may contain little or none, whereas the afternoon specimen may present large quantities.

One day I found in my wards a young unmarried woman of 30 who, so my house physician informed me, had been sent in two days before because she had a large quantity of albumen in her urine. A glance at the patient immediately told me that she was the subject of a fairly pronounced thyroid insufficiency. I pointed this out to the house physician and confirmed the diagnosis by eliciting some answers as to the characteristic subjective phenomena. I then asked that I might be shown the amount of albumen present. To the resident's intense astonishment there was no reaction either to boiling or nitric acid. Three days before the reaction had been very pronounced. The moral of this is twofold. Not only is albumen very commonly present in the urine of those suffering from thyroid insufficiency, but when due to this cause the albuminuria is not infrequently of the postural or orthostatic type.

The adolescent albuminuria of this same type is almost invariably associated with thyroid insufficiency. The thyroid secretion is necessary to the proper utilisation

<sup>1</sup>"Harmless Albuminurias," *Clinical Journal*, April 22nd, 1908.

of the calcium salts, and it is the relative absence of the calcium salts from the blood which gives rise to this intrinsically harmless but erstwhile alarming phenomenon.

In no enumeration of the causes of dyspnea which I can recall have I ever seen myxedema mentioned. And yet, not only in confirmed myxedema, but in degrees of thyroid inadequacy which fall short of complete efflorescence, dyspnea is often a prominent and sometimes an alarming symptom. I have already said that mucin may be deposited in the internal organs without any very obtrusive signs appearing on the surface. This seems to be particularly true of the air passages. Dyspnea on slight exertion is often and quite properly cited as a sign of high blood pressure. It is even more often a sign of thyroid inadequacy. Whether it be that the deposit of tissue obstructs the passages or whether the need for increased oxidation provokes the breathlessness, it is difficult to say. The former is the more probable explanation of the asthmatic or pseudo-asthmatic attacks which so often afflict the subthyroidic. Or, it may be that, in common with the tonsils and the adenoid tissue of the lymphatics, the bronchial glands enlarge and assist in provoking these attacks. Certain it is, at any rate, that the subjects of hypothyroidism are almost invariably troubled by dyspnea on slight exertion, that they not infrequently have asthmatic attacks, even at an early age, and that in later life their sleeping respiration closely resembles that which is known as Cheyne-Stokes. In former years I have frequently sat, wondering why they did not die, at the bedside of patients, who displayed the ominous rise and fall of the respiratory rhythm, which I had been taught to regard as the inexorable precursor of death. I wonder

no longer. I now know that it was not the true brand, and that these invalids were subthyroidic.

If you wish to be amused as well as instructed, it is worth while to spend an hour in listening to an intelligent patient who has been cured of myxedema, while he recounts the story of his mental states during his illness. The feature upon which he will lay most stress will probably be the insistent and overpowering somnolence which overcame him at most unexpected and inconvenient moments. He will tell you that his memory played him the most extraordinary tricks, and that such was the difficulty of anything approaching to sustained attention that he was obliged to renounce all attempts to make a simple calculation, or even to follow the sense of a short paragraph in a newspaper. He will tell you of the most fantastic hallucinations, both visual and auditory, which would seriously have alarmed him had it not been for his serene and incurable apathy. In lesser degrees of thyroid inadequacy these things are all liable to occur, but also in lesser degrees. Somnolence is so frequent as to amount to a rule. And it is not always ordinary sleepiness only: it may be sudden, surprising and short-lived. I have frequently seen patients of this kind who have come to me wearing a tentative label of "*petit-mal*" affixed by a painstaking, but puzzled practitioner. And the mistake is pardonable enough. A sudden loss of consciousness, lasting but a few seconds, which is quite obvious to the onlooker, but of which the patient is totally unaware, is highly suspicious; and unless you remember that such attacks are by no means uncommon in thyroid inadequacy, you will be very liable to cause serious and unnecessary alarm. It is the same with the mem-

ory. This is a symptom for which you must enquire. Patients are chary of talking about it, but once they are embarked, they will tell you the most surprising things. Here is an instance. A stockbroker of 50 years of age came to me complaining of what his doctor called neurasthenia. He weighed 16 stone, his pulse was 48 per minute, and his temperature 95° F. Without being exactly fat, he was lumpy; bulging in unsuitable places. His chief complaint was fatigue, physical and mental. When asked about his memory he seemed much relieved to be able to unburden himself on a subject which, although causing him great anxiety, he had never yet dared to mention to anyone. He has made such ridiculous mistakes in replying to questions in connection with his business, the correct answers to which he knew perfectly well, that he was now obliged to have a clerk in his room to protect him, and he never ventured to give a quotation off hand on "change." His friends thought he had become eccentric. He has now lost this reputation.

Bearing this in your mind, you will probably be surprised to find that some people who are physically very decidedly subthyroidic, succeed in keeping their mental faculties remarkably well sand-papered. I have known two professional men, one a barrister and the other a doctor, who carried on their respective callings with remarkable acumen and conspicuous success, while enormous deposits of mucin were rendering them grotesque in their outward seeming. It is in the presence of such cases as these that one becomes most impressed with the apparent caprice in the site selected for the mucoid deposit, upon which I have already laid stress. Sometimes the encephalon may escape, but when

it is involved, depression of spirits, noises in the ears, deafness, visual phenomena, are only some of the symptoms which may be expected. Night terrors, even in the middle aged, are not infrequent. Hertoghe reports one case in which complete atrophy of both optic nerves occurred.

The treatment proper to thyroid inadequacy is the administration of thyroid extract. I have frequently, and at considerable length, contended that the doses usually employed are much too large. The more a patient requires thyroid extract, the greater is the danger of large doses. It must not be forgotten that in every case there is a deposit of mucin somewhere. It is there whether or not you are able to demonstrate its presence; and before you can relieve the symptoms, you must embarrass the tissues of the mucin. If you do this suddenly or even rapidly, you throw upon the excretory organs, the constipated bowels, the sluggish kidneys and the inactive skin, a degree of labour with which they cannot successfully cope, and symptoms of intolerance quickly appear. Moreover, the rapid removal of this tissue has other inconveniences. If there be much of it in the myocardium, its sudden withdrawal may seriously weaken the heart and you will find that your remedy has produced alarming effects. If it be present in the neighbourhood of nerves, you deprive the structures of a support, a padding to which they have been accustomed, and your patient will complain that your remedy has evoked neuralgias from which she may never previously have suffered. Or, by inhibiting the internal secretion of the pancreas, your large doses may give rise to serious digestive disturbances, and even to glycosuria. If you would treat thyroid inadequacy with success you must have

the patience as well as the courage of your diagnosis. You can afford to wait. Your results will be dramatic enough. Do not try to anticipate them.

The largest dose with which I ever now begin treatment is one quarter of a grain three times daily. This may be cautiously increased to one grain three times daily; beyond this, except in cases of complete thyroidlessness, it is seldom necessary to go. And it is to be remembered that children tolerate thyroid extract far better than adults, so that it is unnecessary to reduce these doses when prescribing for the young. Arsenic and iodine are very useful adjuvants to thyroid administration, and calcium, especially in the young, is almost an essential. For although it is our duty to supply the economy with the thyroid extract for which it is crying, it is no less incumbent upon us to encourage the patient's own gland to resume the work which it had relinquished. These three elements in small doses are very helpful in this direction.

There is one other point of some importance upon which I must touch, that of diet. An inert thyroid means a torpid pancreas and a languid liver; the two latter glands miss the stimulus normally afforded by the former. One of the results of laziness on the part of these two abdominal viscera is the insufficient metabolism of carbohydrate foods. When treating thyroid inadequacy, the quantity of starches and sugars, usually large, which the patient has been in the habit of consuming, should therefore be somewhat severely restricted. This will not increase your popularity. What will increase it still less is the total abstinence from alcoholic drinks which you must certainly enjoin. For, as Hertoghe puts it, "*les hypothyroïdiens recherchent*

*fort les excitants alcooliques.*" A sufficiency, what may even seem to be an excess of water, taken preferably before meals, must be insisted upon. To ask of the emunctories that they will dispose of the mucin without the aid of plenty of fluid, is to expect them to make bricks without straw.

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#### THE CLINICAL IMPORTANCE OF CONSIDERING THE CORRELATION OF THE INTERNAL SECRETIONS.

BY

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Though there can be little doubt that the various internal secretions are most closely correlated, yet perhaps the most difficult, and also most fascinating problem of present day medicine, is to assign to each its proper place and right share of importance. The main place of therapeutic

importance among the internal secretions has hitherto been given to the thyroid gland. Indeed there are few ills of the human body that are not in some way influenced by this most wonderful organ, which is certainly essential to health if not to life itself. Thyroid medication, alone, is a most fascinating study, and by judicious use of thyroid extract one may often achieve really remarkable results. But one of the facts which strikes one in reading the multitudinous accounts of thyroid medication, and of illnesses which are therefore reasonably argued to depend in part at least, upon vagaries of thyroid activity, is that many of the results obtained are most difficult to reconcile, and may even be diametrically opposite. It is easy to cite examples. For instance, a few years ago a well-known London surgeon, having observed unmistakable postmortem evidence of hyperactivity in thyroid glands of patients who had died of cancer, and being unable to discover any cases or records in which cancer was associated with myxedema conceived the idea that hyperactivity of the thyroid gland was a factor in the course of dissolution by cancer, and that hence partial thyroidectomy would be beneficial to patients suffering from otherwise inoperable cancer. On putting his theory to the test, it was apparently justified by the good results which followed, and were duly published. Since then, however, many accounts have been published, in which cases of microscopically proved cancer have been cured by treatment with thyroid extract. And probably, on the other hand, many of us could cite cases (which we have not published) in whom the administration of thyroid extract did not appear to have any discernible influence upon the progress of the cancerous growth.

Again, a few years ago, a remarkable series of cases of nocturnal enuresis cured by thyroid treatment was published by Dr. Leonard Williams. That author, however, discovered that excessive doses of thyroid extract were not only futile in this condition, but even made matters worse. Since the appearance of his article many other writers have tried the remedy with varying success. Personally, I have succeeded admirably with it in many cases, but I have also found some in which it was quite useless, whether given in large or small doses, and several times I have even known enuresis arrive *de novo* during a course of thyroid extract treatment which was being administered for some other purpose, which enuresis ceased on withdrawal of the medicament.

Rheumatoid arthritis will furnish another example of contradictory evidence. Many cases have been published illustrating the value of thyroid treatment in this refractory condition. Yet recently an article was published (*I think in the Brit. Med. Jour.*) in which the writer concluded that excessive thyroid activity is an essential feature of this disease, and he most rationally based his argument upon the fact that three of the cardinal symptoms of rheumatoid arthritis, namely the rapid pulse, sweating palms, and anomalies of pigmentation are all classical features of Grave's disease.

My next instance of contradictory results shall be the influence of iodine in Grave's disease. We know that iodine is an essential ingredient of thyroid secretion, and that this secretion is excessive in Grave's disease. It is an elementary deduction that iodine is bad for Grave's disease and likely to aggravate it, and this doctrine is now widely disseminated and accepted

at the present time. Dr. Rendle Short, the author of "The New Physiology in Surgical and General Practice," says "there is abundant evidence that iodides, and especially organic combinations of iodine such as iodoform, have great power in enhancing the activity of the thyroid gland" and he records a case in which Grave's disease "clearly followed the application of iodoform to an absorbing surface." The onset of Grave's disease has also coincided with inflammation at the root of a tooth, and been seriously attributed to the painting of the gum with iodine. If one follows the argument to its logical conclusion one ought to treat Grave's disease by prescribing an iodine free diet, and to withhold all forms of iodides. Theoretically this should give good results, as a thyroid without iodine is probably impotent, but in practice it would be very difficult to accomplish because the ordinary articles of diet contain so little iodine that we should hardly know what to forbid and what to allow. Probably no fruit or vegetables would be permissible, and salt would have to be interdicted. But even milk and flesh foods might theoretically contain some of the thyroidal products of the animals from which they are derived. But on the other hand authoritative writers recommend the application of red iodide of mercury, in the form of ointment, to the neck in Grave's disease, and personally I have obtained some of my best results by the internal administration of Tinct. Iodi (B. P.) m. v in Aq. dr. i. I have one patient whom I have treated for over a year with most other known remedies including Moebius's serum, and have always come back to Tinct. Iodi. proving that at any rate in her case it is the best remedy of the lot. This patient is quite convalescent now, has been

back at business for over six months, but cannot get on without her iodine. Exophthalmos is now her most marked symptom. I know another lady who was absolutely cured with this remedy, and in whom not the slightest sign of Grave's disease now remains. And in three other cases, two of them dangerously acute I have prescribed the same remedy with immediate and striking benefit. Several times I have seen the occurrence of a serious relapse within a week or so after leaving off iodine, and immediate improvement on resuming it. Under the influence of iodine the goitre of Grave's disease sometimes enlarges and becomes very hard whilst the pulse rate becomes much slower and there is great improvement in the general health, cessation of diarrhea and lessening of nervous symptoms. It may then happen that on leaving off the iodine the goitre suddenly becomes much smaller and softer with an aggravation of all the symptoms. A simple explanation of this occurrence which I have several times witnessed, is that the artificially supplied iodine achieves the object for which the thyroid is so energetically and disastrously striving, and in consequence thyroid excretion is lessened, and a fresh storage of thyroid secretion occurs within the gland, distending the vesicles with colloid, and so producing enlargement and hardening of the goitre. But when the extraneous supply of iodine is stopped, there is a fresh outcry from the organism, whereupon the thyroid gland immediately discharges its reserves into the circulation, with a natural recurrence of symptoms of thyroidism, accompanied by decrease of the goitre. My present attitude towards the use of iodine in Grave's disease is that although small, or even minute, doses may theoretically stimulate the

gland, and in various published cases apparently have done so, yet large doses, such as those I have mentioned, have a precisely opposite effect.

Yet another instance of contrary results may be cited in the case of tetany. Tetany is considered by many authorities to depend upon parathyroid insufficiency. Other no less weighty authorities prefer to look upon the thyroid and parathyroid as one apparatus, and Swale Vincent, who adopts this view, states that removal of thyroids only, may sometimes give rise to tetany. Yet recently a case was published, in which an accidental overdose of thyroid tablet produced a severe attack of tetany in a young child. But it matters little for my argument whether tetany depends upon thyroid or parathyroid influence. Even if the parathyroids be the dominant factor, it is evident that these are controlled by the thyroid gland, for, as we have seen, tetany may result either from removal of the thyroid gland or from an overdose of thyroid extract. The thyroid and parathyroid glands each hypertrophy after the removal of the other, so there is little need to emphasize the obviously close relationship of these glands. It is quite possible that tetany is primarily dependent upon calcium metabolism, which in turn is influenced by most of the ductless glands. Changes in the calcium metabolism have been noted after removal of the thymus, which, however, sometimes contains accessory parathyroids; in disease of the pituitary gland, eg., acromegaly; in disease of the pineal gland, eg., abnormal skeletal growth; after castration, which produces increased longitudinal growth of the bones, with retarded ossification of the epiphyses; after ovariotomy, often beneficial in osteomalacia; and after removal of a single

suprarenal gland, which produces great increase of the urinary calcium excretion (Blair Bell). Suprarenal extract has been recommended for the treatment of osteomalacia.

This wide spread influence of the various ductless glands upon calcium metabolism is an excellent illustration of the fact that when we are considering the influence of some particular internal secretion upon the economy, we shall only make confusion worse confounded if we neglect the influence of the other internal secretions. In short we must beware of the view that man consists of two parts, the chief of which is the thyroid gland, or the pituitary gland or whatever our own particular interest may be. This is an error to which human nature is particularly liable, and it finds its climax in the minds of the parturient woman and the midwife who divide space into two portions, the genital passage and "the world" and gravely inform you that the baby's head is in "the world"!

It is probably the varying influence of the other internal secretions, which explains the contradictory results so often obtained when one is attempting to elucidate the action of some single one among them. Considerable stress has been laid upon the antagonism of different internal secretions by various authors. I believe we should gain a truer insight into their working if we dwelt rather upon their harmony. It does not strike me as a very high conception of the human organism that health should consist in the balance of dissentient or antagonistic forces. It would seem far more ideal that all the internal secretions should work together for the common good of the organism, and that when some special demand is made upon a particular gland the others will work in harmony

with it, and as far as possible assist it. Every gland is probably necessary for the perfect activity of the rest, and the harmony between the glands is demonstrated by physiological experiments. One of the chief limitations of experimental physiology is that it is continually dealing with artificial conditions that do not occur clinically. Yet when it is found that removal of an organ constantly induces either atrophy or hypertrophy of some other organ, we can reasonably deduce that in the first case the organ removed is essential to the welfare of the one that atrophies in its absence, and in the second case that the hypertrophying organ is endeavoring to replace the lost one, in some degree, and that therefore the two organs have a kindred function.

The association between the thyroid gland and the hypophysis is shown in this manner, as each gland hypertrophies after removal of the other. The suprarenal gland also hypertrophies after the removal of the thyroid. Removal of the suprarenal is, of course, so quickly fatal that there is no time for definitely marked changes to occur in the hypophysis or thyroid. But in any case the demonstrated facts of hypertrophy clearly point to an *entente* or even a triple alliance between thyroid, hypophysis and suprarenals. And the genital system is absolutely dependent upon the integrity of these three. Atrophy of the testicles or ovaries occurs after removal either of the thyroid or anterior portion of the pituitary gland. And amenorrhea and impotence are both usual in Addison's disease, and in early cases infantilism of the genital organs would appear to be the rule. On the other hand removal of the ovaries certainly causes a temporarily increased thyroid activity, and has even been fol-

lowed by rapidly fatal Graves' disease (Blair Bell). But although the presence of adequate thyroid secretion is necessary for the welfare of the genital system, an excess is markedly deleterious. Graves' disease in the young male delays development of the genital organs, and in the adult female is commonly associated with partial or even complete arrest of the menses. The suprarenals and the thyroid gland both have a special influence upon the sympathetic nervous system, and in the remaining space at my disposal, I wish to trace some steps in the remarkable analogy between the effect of thyroid medication and the known influence of suprarenal extract upon various functions of the body. It would appear probable that one of the effects of thyroid medication is to stimulate the suprarenal glands, or perhaps assist them in some function which was previously performed imperfectly or with difficulty. And varying results will of course be obtained according to the capacity of the suprarenal glands to respond to such stimulation or otherwise. Let us consider some of the parallels in function of the thyroid and suprarenals.

Take first the case of blood pressure. The influence of the suprarenal glands in raising blood pressure is too well known to need further comment. As to the influence of thyroid, it is unfortunate that early physiological experiments led to error and in consequence it is still widely held that the thyroid lowers blood pressure. Such, however, is not the fact. I have observed on many occasions that the clinical result of administering thyroid extract is to raise the blood pressure provided the heart is strong enough to stand the increased work that is necessarily demanded of it. I have discussed the sub-

ject at length in "*The Practitioner*" (London, May, 1913) and cannot give further details here, but anyone may readily verify the fact for himself by means of the sphygmomanometer. Further, the blood pressure is invariably raised in Graves' disease so long as the heart is not seriously overwrought. The conditions are not difficult to understand, so long as the heart is sound, the pressure is high, and may even be used as a gauge of the extent of thyroidism. But when the heart is fatigued and its action excessively rapid, tumultuous and irregular, its efficiency is of course lessened and there results a fall of blood pressure, though it commonly still remains above the normal. Lessen the work of such a heart by rest, or even regulate or conserve its energy by drugs and the pressure will rise. But as the Graves' disease itself improves under rest and treatment, thyroidism is lessened and the blood pressure again falls, I have verified this result many times and have seen no occasion to change my views. It is said that in myxedema the blood pressure is low, and also that in Graves' disease the blood contains from four to eight times the normal amount of adrenalin. (Biedl.) And many of the symptoms of Graves' disease may well be referable to this excess of adrenalin. For instance adrenalin produces acceleration and strengthening of the heart beat. Adrenalin produces constriction of the internal vessels of the genital organs. Reference has already been made to the amenorrhea of Graves' disease in the female, and delayed development of the genitals in the young male. Adrenalin produces glycosuria which is not infrequently met with both in Graves' disease and as the result of excessive thyroid medication. Adrenalin increases the heat-tone, which is invariably raised in Graves' dis-

ease. Conversely the temperature is subnormal both in myxedema and Addison's disease. Adrenalin produces strong contraction of the pregnant uterus, and the administration of large doses of thyroid extract will produce abortion. Adrenalin produces widening of the palpebral fissure, and contraction of the orbital muscle, which gives rise to exophthalmos, a frequent but not invariable feature of Graves' disease. Now these characteristics of Graves' disease may one and all be produced by thyroid feeding, which proves that they are really caused by the influence of the thyroid gland, acting upon some portion of the economy, and are not mere coincidences due to some extraneous cause. The inference is obvious that the suprarenal glands participate in their causation, being apparently stimulated to increased activity by the thyroid. Both thyroid and suprarenals are said to inhibit the secretion of the pancreas, and so presumably cause glycosuria, but the action of adrenalin in producing glycosuria, even if transient, is constant, whereas thyroid administration apparently does not always have this effect. It is therefore quite possible that the thyroid influences the pancreas second hand, by stimulating the suprarenals. Then, in the case of a slight degree of suprarenal deficiency or exhaustion the thyroid stimulation would naturally produce a less effect, and the resulting suprarenal activity might only reach the normal, and so no glycosuria arise. Lastly long continued stimulation is likely to produce secondary exhaustion, and this would account for the occasional anomalies of pigmentation in Graves' disease, which may even coexist with Addison's disease. Some have even attributed Graves' disease to suprarenal deficiency, the thyroid endeavoring to act

vicariously for the suprarenals. The late Gibson of Edinburgh was most enthusiastic in recommending suprarenal extract as the remedy for Graves' disease, and doubtless it might be effective in some cases, but there is no logical reason for giving it in the majority of cases, in which an excess of adrenalin is already present in the blood. But there are other clinical conditions which may be benefited by thyroid treatment, in which there is good reason to suppose that the real fault lies with the suprarenal glands. Urticaria, and enlarged tonsils and adenoids may be mentioned. Urticaria is doubtless in part an error of calcium metabolism, which as already mentioned, is influenced by most of the ductless glands. But I have often cured urticaria with thyroid extract, and also met with it in Graves' disease. This is another contradiction, which is easily explained by the supposition that the suprarenal glands were sluggish in the first case but responded to stimulation, and were partly exhausted by prolonged stimulation in the case of Graves' disease. And there is an obvious vaso-motor factor in urticaria which would naturally belong to the suprarenal department, and to clinch the argument suprarenal extract may often be successfully employed in treating this condition.

As to tonsils and adenoids. One of the striking effects of an intravenous injection of adrenalin is to produce vasoconstriction of the nasal mucous membrane, which of course is usually hyperemic and congested in the presence of enlarged tonsils and adenoids. Further, in many cases of *status lymphaticus*, to which category many of those with adenoids in reality seem to belong, a lesion of the suprarenal glands can be demonstrated in the postmortem room. It seems highly probable that a

relative degree of suprarenal deficiency or exhaustion following a period of ill health is an important factor in the causation of enlarged tonsils and adenoids. Suprarenal lesions are usually found after death from almost any toxemia including the exanthemata and serious microbial infections, and therefore these same glands must suffer to a less extent in the milder cases. In such cases the administration of thyroid extract may act by stimulating the flagging suprarenal glands, or possibly by lessening their work in some other direction. And the varying capacity of the suprarenal glands to respond will explain why thyroid treatment succeeds admirably in some cases but is less effective in others. For a time, following the lead of Dr. Leonard Williams, I have regarded the presence of enlarged tonsils and adenoids as a confession of thyroid inadequacy. But one of the difficulties in the way of adhering to this view is the fact that one gets two very distinct types of children with this symptom. One is the dull, stupid, heavy type, of stunted growth and dry, coarse skin, with possibly some rickety symptoms added. It is not difficult to believe that he is thyroid deficient, and his improvement under that line of treatment will probably be remarkable. But the other, perhaps commoner type, is vivacious and alert, full of mental energy, though perhaps getting easily tired physically and in consequence irritable or peevish always wanting to know "What are we going to do next?", generally tall in proportion to the age, but not correspondingly heavy though on account of the increased height the weight may be above the age average. The skin is fine and perspires readily. Appetite is often capricious, night terrors or other nervous symptoms, even habit spasm

or tic, are frequently present and there may or may not be enuresis. These cases also improve on thyroid, some more than others, but they soon reach a stage when thyroid does not seem to do any more good, though the condition is still unsatisfactory. I am now treating these cases with suprarenal gland tablets and getting most encouraging results though my cases are too few to generalize from as yet. Tonsils are diminishing, and in one case tic quickly disappeared after a year's duration. This child had been well treated with thyroid and improved to a certain point. It is therefore a tempting explanation that these cases are really due to suprarenal deficiency. That the patient's own thyroid is attempting to act vicariously for the suprarenals and may even show signs of exhaustion as the result of such work. In many cases we see the result of increased thyroid activity in the excessive growth, increased metabolism and nervous irritability of the child. Additional thyroid medication is in accordance with Nature's attempts to rectify the condition and frequently does good, especially if there be some degree of secondary thyroid exhaustion. But if the hypothesis be correct, suprarenal extract should be the better remedy. Wiesel ascribes death in *status lymphaticus* to hypoplasia of the chromaffin system. Postmortem findings in such cases are enlargement of glands in the neck, axilla and mesentery with hypertrophy of the thymus, and of the lymphoid tissue in the nasopharynx, at the base of the tongue and in the spleen. There is also congenital smallness of the heart, aorta and peripheral vessels, and colloid degeneration of the thyroid gland, in addition to the lesions of the suprarenal capsules.

Experimental removal of the thyroid gland is followed by hypertrophy of the suprarenals, and this hypertrophy is sometimes accompanied by well marked atheroma of the aorta in goats and sheep. Presumably the suprarenals hypertrophy in order to act vicariously for the thyroid, and the atheroma is a byproduct of such increased suprarenal activity. Atheroma, of course, may readily be produced by repeated injections of suprarenal extract. Injections of adrenalin produce a slight decrease in the circulation of the thyroid, which suggests that when the suprarenals are active there is less work to be done by the thyroid. With the suprarenals of course must be grouped the rest of the chromaffin system, but I have used the term suprarenals for the sake of convenience. Finally we must not forget that adrenalin is derived only from the medulla, and that the physiological action of the cortex is probably fully as important if not more so.

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## THE RELATION OF THE THYROID GLAND TO INFECTIONS AND TOXEMIAS.

BY

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Among the many functions which from time to time have been ascribed to the thyroid gland, none has received less acceptance than that of protecting the organism against intoxications or infections. Yet even the earliest investigators were able to

show that animals from whom the thyroid gland had been removed were particularly susceptible to various infections; an observation, which in itself would seem to lend considerable support to the hypothesis. In recent years much work has been done which favors the view that the thyroid-parathyroid apparatus does indeed act in this way, and a stage has arrived at which it may be well to pass in review some of the evidence which points in this direction. I say advisedly, thyroid-parathyroid apparatus, and here at once, I come to grips with those who hold that the parathyroids have functions distinct from those of the thyroid, and anatomically as well as physiologically should be regarded as separate glands. The work of Gley, Vassale, Generali and their disciples has profoundly modified the whole literature on the functions of the ductless glands, but there are some who have never wholly accepted their conclusions, and since they were formulated other investigators have presented evidence which, at the least, shows that the sceptics were justified. Thus, Swale, Vincent and Jolly<sup>1</sup> found that after thyroidectomy, the parathyroids come to resemble ordinary thyroid tissue histologically, and ultimately in some cases cannot be distinguished from it. They lay stress on the close association, embryologically, between the two kinds of tissue, and in the absence of any fundamental difference between their constituent cells. Within the thyroid gland proper, is to be found a varying amount of intervesicular structure, which is indistinguishable from parathyroid tissue. Mrs. F. D. Thompson<sup>2</sup> from a very large number of observations, has shown that these intervesicular cells vary widely in amount in different species of animals, in different animals of the same

species, and even in different parts of the same gland. Moreover where the thyroid and parathyroid glands lie in contact, and this is especially true of the internal glandule, every stage of transition may be seen between the parathyroid arrangement and the colloid-containing vesicle of the thyroid. In the case of the ox, she has demonstrated the actual presence of what may be called colloid vesicles in the parathyroid tissue. Forsyth,<sup>3</sup> also—from the point of view of comparative anatomy and histology—comes to the same conclusions, and regards the parathyroids as exercising a particular function apart from that of the thyroid. He, too, describes transitional and intermediate types of the gland. In this connection it is worthy of mention that these views agree with those of Berry<sup>4</sup> founded on clinical experience, who, in a series of 751 operations for goitre, has never paid any attention to the parathyroid glands, and in no single case has encountered post-operative tetany. He has found that, provided a sufficient amount of thyroid be left behind, it does not matter in the least whether the parathyroids are present in the part removed or not. These observations sufficiently excuse the position I am taking in this article, of considering under the one term "thyroid action" the function of both parts of the thyroid-parathyroid apparatus, irrespective of the fact that many authorities would contend that the defensive power is attributable to the parathyroid only.

#### Indications of the General Antitoxic and Bactericidal Activities of the Thyroid Gland.

Before considering any action that the thyroid may have in opposing toxins and bacteria derived from any particular source,

it may be well to recapitulate some of the work which indicates a general antitoxin or antibacterial power invested in the gland.

Fassin<sup>6</sup> found that in thyroidectomized dogs and rabbits, the hemolytic and bacterial alexines were considerably lessened, and Marbé<sup>8</sup> has noticed that administration of thyroid by the mouth both in man and in animals, raises the opsonic content of the blood, and the phagocytic power of the leucocytes. This improvement in the opsonic index was also noticeable after the injections of aqueous extracts of the gland. On the other hand, after thyroidectomy or with myxedema, the phagocytic and opsonic indices are lowered. However, as Fjelstad<sup>7</sup> insists, this investigation concerns the normal opsonins and complement, and does not signify an enhanced or diminished production of the opsonins or other immunizing bodies in active immunity. Sajous<sup>8</sup> provoked increased activity of the thyroid by the injection of various bacterial toxins in man and animals, and Bayon,<sup>9</sup> by the injection of toxins into the gland itself, produced actual goitres. Hürthle<sup>10</sup> increased the amount of thyroid secretion by ligaturing the bile ducts of dogs, possibly due to the passage into the blood of certain constituents of the bile, but also conceivably explicable on the grounds that the normal bactericidal power of the bile in the intestine was interfered with. Turro<sup>11</sup> subjected the bacilli of cholera, typhoid and anthrax streptococci and bacilli coli communis to the action of the juices of the thyroids of pigs and sheep, and found that they were almost wholly dissolved by them. De Luca and d'Angiaro<sup>12</sup> found the toxic equivalent of the urine of thyroidectomized animals to be increased and that this increased toxicity was diminished by the administration of thyroid extract.

Very important in this connection is the recent work of Rupert Farrant.<sup>13</sup> This worker chronicles the effect on the thyroid gland of four varieties of clinical toxemia, namely, those of infantile diarrhea, of diphtheria, of measles and broncho-pneumonia, and of whooping cough and broncho-pneumonia. According to him the following changes occur:—*firstly*, the colloid becomes finely granular; *secondly*, it becomes vacuolated and partly absorbed; *thirdly*, the cells become more numerous, elongated approaching the columnar type and arranged in masses; *fourthly*, the colloid becomes entirely absorbed and the walls of the vesicles crenated and infolded; *fifthly*, the infolding and cell-increase go on to transform the vesicles into solid masses of cells. He induced similar changes by the injection of diphtheria toxin into guinea-pigs. In other words, the toxins of certain diseases, and diphtheria toxin experimentally injected, produced all stages of reactive hyperplasia amounting to the changes found in Graves's disease. However, from the study of the thyroid glands of horses used for the preparation of diphtheria antitoxin he found that the hyperplasia decreased as the antitoxin value of the serum increased. This might be read as suggesting that when the tissues generally provide immunity products, the burden on the thyroid was relieved the toxins being neutralized by the antitoxin formed. Reid Hunt has found that the administration of small amounts of thyroid to mice renders them relatively immune to poisoning by acetonitrile and also that nearly twice as much acetonitrile was required to kill mice which had been fed upon the blood from a case of Graves's disease as was required to kill other mice fed on normal blood.

## Indications that the Thyroid Gland has Special Protective Activities Against Toxins and Bacteria of the Alimentary Canal.

It might be expected that if the thyroid exerts any protective action at all it would do so especially against bacteria and toxins in the alimentary canal, since in certain of the lower animals—amphioxus, ascidians, fishes, and lower vertebrates—the gland communicates with the pharynx, and, by means of a duct, pours its secretion directly into it.

There is a considerable amount of evidence which satisfies this expectation. Thus Marine and Lenhart,<sup>14</sup> from a study of goitre as it occurs in brook trout, found that where these fish are kept in tanks situated one above the other, and through which the same water flows from the uppermost to the lowest, the number of goitrous trout increases from the highest to the lowest tank. These authors conclude that "overfeeding, overcrowding and a limited water supply are the major factors in the production of filthy, unhygienic tanks and ponds, and the insanitary, unhygienic and filthy tanks are in a very important but still unknown manner associated with the development of thyroid hyperplasia. Goitre did not appear in the fish living in the water above the first tank, nor in those in the water escaping from the last. As McCarrison<sup>15</sup> points out, in these tanks much suspended matter is deposited, which forms a nidus for the growth of numerous bacteria and animalculae, and though Marine and Lenhart regarded the goitres as due to metabolic and nutritional disturbance, they might also be ascribed to the ingestion of the large number of organisms present."

Working in the valleys of Gilgit and Chitral in Northern India, McCarrison<sup>16</sup> found that of 36 individuals who consumed untreated suspended matter of a goitre producing water, 21 showed no change in the thyroid gland which could be detected clinically, 10 developed a notable enlargement, whilst 5 showed a transitory swelling of the organ. Of the 31 individuals who consumed similar suspended matter which had previously been boiled, none showed any reaction in the direction of increase in size of the thyroid. From these experiments he inferred that the goitre produced in this way must almost certainly be due to the living component of the suspended matter. With these conclusions the results of Bircher,<sup>17</sup> who produced goitre in rats by administering to them the water of goitre-producing springs, are in agreement, and this worker supports the view that there is present in suspension in goitre-producing waters a living agent which is the direct or indirect cause of the disease. The beneficial effects on goitre of intestinal antiseptic treatment affords further evidence. McCarrison<sup>18</sup> treated over 100 cases with 10 grains of thymol night and morning. Of these he was able to watch the effect in 82. Sixty-eight were cured or markedly benefited whilst 14 were unaltered or only benefited to a slight degree. B. naphthol also acted favorably in his experience; and iodine, another intestinal antiseptic, is well known for its occasional salutary effect on simple enlargement of the gland. It is not claimed that these various antiseptics profoundly modify the numbers or activity of the intestinal flora, but it is reasonable to suppose that they exercise some slight effect (in the case of thymol the organisms have been computed to be reduced one-thirteenth) and this may

be enough to relieve the thyroid activity to some extent and allow of the return of the gland to normal dimensions. The *rationale* for the use of fresh cultures of *B. Bulgaricus* founded in Metchnikoff's work is too well known to need repetition. McCarrison treated 8 cases of goitre in this way, administered to the patients from 10-20 ounces of sour milk daily. Four were cured, 2 improved, and 2 showed no appreciable change after six weeks.

Sir Arbuthnot Lane<sup>19</sup> among the several lesions which he lays at the door of "intestinal stasis" includes parenchymatous goitre, which, like the other lesions, he ascribes to "alimentary toxemia," and Chapple<sup>20</sup> and Rowell<sup>21</sup> and others have recorded instances where a goitre has diminished considerably in size as the result of ileosigmoidostomy performed by Sir Arbuthnot Lane for this condition. Without agreeing with that author *in toto* on the importance and cause of intestinal stasis, and whilst disagreeing with the term "alimentary toxemia" as denoting its effects, I think it is nevertheless germane to this article to note that goitres have diminished in size as the result of an operation which has the effect of draining the intestine. The views of Adami<sup>22</sup> who holds that intestinal subinfection is the real cause of the pathological effects seem to me to be more tenable, especially in view of the good results which follow vaccine treatment.

McCarrison<sup>23</sup> has treated 33 cases of goitre by means of vaccines prepared from organisms similar to those known to be normal inhabitants of the intestines, and which according to Metchnikoff and many other writers, may also produce pathological results. These vaccines had a remarkable effect in diminishing the size of the gland in recent cases of enlargement, as the photographs and measurements exhibited

by McCarrison at his Milroy lectures testify. The vaccine which he found most generally useful was a "composite" one prepared from bacterial growths on Musgrave's medium, and consisting almost wholly of organisms of the *b. coli* group. Using autogenous vaccines from the feces, grown on the same medium, I have been able to corroborate his results, but I have not had the same opportunity for selecting early cases. His were examples of the endemic goitre of Northern India, of which he has made a special study, mine were English cases. I have now treated 18 cases in all by this method, in 16 of which I have been able to watch the results. In only 4 could the goitre be described as of recent origin. Of these 4 it disappeared entirely in 2, was remarkably diminished so as scarcely to be noticeable in 1, and was apparently uninfluenced in 1 after 6 injections. The nature of the goitre in this case is, at present, undetermined. It is a rapid and serious form of enlargement, and, as obstructive symptoms were present, I thought it advisable after a short course of vaccine treatment to transfer the patient to a surgeon. The remaining 12 were all of long standing, but with the exception of one, were sent on to me by Mr. Berry as examples of simple parenchymatous goitre. Vaccines in every case caused some diminution of the gland, the surrounding simple enlargement subsided considerably, and as a result adenomata and cystic swellings of degeneration became palpable. The results were satisfactory in so far as the patients were concerned, for by demonstrating the presence of local swelling in the gland I was able to refer them back to Mr. Berry who could then operate for adequate reasons under easier conditions than would otherwise have been the case. In a few, obstructive symptoms were present, dys-

pnea, alteration in voice, difficulty in swallowing and in one, stridor, all of which were relieved by the treatment. The doses employed were 250 millions to 500 millions of organisms, at weekly intervals, for ten to twelve doses, except in one early case in which the thyroid swelling subsided after the first dose. The *rationale* for the treatment is not easy to prove, but from the trend of the evidence stated above, I can only suppose that the vaccines combatted in these cases a subinfection from the intestinal tract, which was the determining cause of the goitrous enlargement.

As a final contribution to this part of the subject may be mentioned McCarrison's<sup>24</sup> observations on the transmission of goitre from man to animals. "In animals which drank only water highly polluted by feces" (from goitrous individuals) "for periods up to 108 days there was a tendency on the part of the thyroid to be larger than normal and to exhibit on microscopical examination an increase in size of the vesicles, irregularity and thinning of their walls, and distension of the vesicles with colloid; in animals which were fed on cultures of bacteria for the same length of time there was a tendency on the part of the thyroid to be smaller than normal, while the histological appearances of the organ were those of active hyperplasia, often very pronounced." This diminution in size in association with active hyperplasia was also noted by Farant<sup>25</sup> in connection with the infection of bacterial toxins and is regarded by him as an early stage of the reaction.

#### Evidence Obtained from Correlated Clinical Conditions.

Many suggestive truths bearing more or less directly on the subject may be gleaned

from a consideration of diseases clinically correlated with the thyroid gland and its affections. A full exposition of this aspect of the subject would take more time and space than it deserves, and I will confine my remarks to two conditions only—tetany and rheumatoid arthritis, by which I mean not osteoarthritis, but that form of relatively acute arthritis which occurs commonly in young people before middle life, and is also known sometimes as infective arthritis of unknown origin.

In tetany also we have a condition which is known to follow ablation of the thyroid-parathyroid apparatus, and in its incidence to be closely related to that of goitre and cretinism on the one hand, and on the other to certain toxic conditions commonly seen in this country in association with gastro-intestinal disturbances. Most of the cases occur in infants who are rickety, but only in the presence of abnormally loose, undigested, or offensive motions. Other important causes are gastric dilatation and as I have shown, in a series of 12 cases, dilatation of the colon.<sup>26</sup> In all these there is in all probability a state of intoxication from the bowel, and in the case of infants especially, this is also borne out by the not uncommon occurrence of an associated toxic edema. In gastric tetany this hypothesis has been carried a step nearer to proof, for from the contents of the dilated stomach in such cases Bouveret and Dévic have obtained a toxic substance which when injected into animals, produced the clinical syndrome of tetany. In many instances of gastric tetany the symptoms are not relieved until the contents of the stomach have been washed out. This is true also of tetany in association with dilatation of the colon, where colonic lavage usually temporarily cures the tetany, although it returns when the motions

become variegated, pultaceous or offensive. Many instances have also been recorded where tetany has been successfully treated by the administration of thyroid or parathyroid extract.

The relationship between rheumatoid arthritis and the thyroid gland is a fairly close one. Kent Spender<sup>27</sup> drew attention in 1888 to the many points of affinity between rheumatoid arthritis and Graves's disease. In both these are quickened pulse-rate, somewhat similar disorders of pigmentation, localized sweatings and localized edemas as Llewellyn Jones<sup>28</sup> points out. Both these observers record examples of the two diseases in members of the same family, and Llewellyn Jones has recorded 14 examples of the complete type of Graves's disease and 6 of the incomplete type existing side by side with rheumatoid arthritis. McCarrison also in his work on endemic goitre and endemic cretinism emphasizes the frequent association of rheumatoid arthritis, goitre, cretinism and tetany. Moreover, in the treatment of this condition also, thyroid extract has been employed with considerable success in certain cases. These data concerning rheumatoid arthritis are seen to have a bearing upon the subject under discussion, when the possible causation of that disease is taken into account. Many authorities refer to the etiological relationship between rheumatoid arthritis and gastrointestinal disorders. Llewellyn Jones<sup>29</sup> sums up the most cogent facts which support the view that rheumatoid arthritis is gastrointestinal in origin as follows:—*Firstly*, the great frequency with which gastrointestinal disorders precede or accompany the joint affections; *secondly*, the existence of interconnecting symptoms; *thirdly*, the presence of conditions favourable to intestinal putre-

faction, such as oral sepsis, and deficiency of free HCl in the stomach; *fourthly*, evidence of intestinal putrefaction as found in the urine; and *lastly*, the beneficial effects of treatment having for its object the diminution of intestinal putrefaction." To this may be added the good results which in Kenneth Goadby's<sup>30</sup> hands, have followed the use of autogenous vaccines prepared from cultures of organisms obtained from the patients' mouths in which pyorrhea alveolaris is found.

✓ In this article I have attempted to marshal certain data which seem to show: (1) that the thyroid reacts to intoxications and infections; (2) that this is especially true of those derived from the alimentary canal, and (3) that the reaction is of the nature of a hyperplasia and therefore presumably serves some useful purpose. Without wishing to dogmatize or exaggerate the importance of the thyroid in this connection, these data taken together, do, I think, lead almost inevitably to the conclusion that among the activities of the thyroid gland that of counteracting toxins and infections must be included. ✓

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## THE INTERNAL SECRETION OF THE OVARY.

BY

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Glasgow, Scotland.

Much of our knowledge upon the function of the internal secretory organs or ductless glands is still contradictory, and we require further confirmation of that knowledge both by clinical and by laboratory methods. The field for further research lies in the direction of observations

upon function and upon metabolism. Fallacies and contradictions will still flood the literature as long as there is failure of collaboration between the laboratory worker and the clinician. Phenomena observed in animals do not always manifest themselves in the human individual, and, until statements have been proved by both sets of workers, we cannot accept them as facts.

Researches upon the ovary show clearly that, although this organ has for its primary function the production of ova, it bears at the same time a considerable share in the maintenance of the physiological equilibrium of the other internal secretory organs. The ovary influences the processes of metabolism and the development of the individual. Results from the experimental removal of the ovary in animals, together with clinical observations, have shown that this organ has a most important dual function, and that in surgical practice oophorectomy should not be undertaken unless for some grave pathological lesion, if the best ultimate interests of the patient are to be considered.

The ovary may be divided up into three constituents: the *Graafian follicle*, the *corpus luteum* and the *interstitial cells*. All three have a common origin from the oogonia or mesothelial cells of the genital ridge. As development proceeds the allocation of function causes some differentiation in the histological appearance and arrangement of these cells. (Waldeyer, von Winiwarter, Skrobansky). The stroma is mainly supporting and vascular.

The *Graafian follicles* include and are mainly concerned with the development of the oocytes, the follicle cells being nutritive and protective in function.

The *corpus luteum* is a further stage of the Graafian follicle, and it reaches its full

development after rupture has taken place with extrusion of the oöcyte. The lutein cells as now generally accepted are derived partly from the follicle cells and partly from those of the theca interna. After extrusion of the oöcyte a certain amount of hemorrhage takes place into the cavity, at least so far as the human corpus luteum is concerned. This is denied by Sobotta and quoted by Noël Paton. But these hemorrhagic corpora lutea are observed too frequently at operations upon the pelvic organs to be considered other than physiological. The corpus luteum of menstruation and that of pregnancy are identical, the latter being but a further stage of development of the former. The corpus luteum has a more complex function than that of preserving the circulation of the ovary and preventing the formation of excessive scar tissue as was formerly supposed. Fränkel's experiments showing that the corpus luteum has a trophic influence upon the embedding of the ovum in the uterus are accepted to a certain extent in that they apply to animals such as rabbits; the theory that the removal of both ovaries in early pregnancy is followed by abortion does not apply to the human individual, as numerous cases are reported of oöphorectomy during pregnancy without the occurrence of any subsequent expulsion of the uterine contents. There is no doubt that the corpus luteum has a certain degree of influence in controlling the vascular supply of the uterus, and also upon the changes which take place in the mucosa preparatory to and during early pregnancy, but what the nature or extent of this influence is we are still in ignorance. Loeb thinks that the corpus luteum has a secretion which sensitizes the uterine mucosa and prepares it for pregnancy. Swale Vincent believes

that the corpus luteum does not affect the onset of estrus in animals but that it is caused by some other portion of the ovary. It has been stated that the presence of a corpus luteum exercises an inhibitory effect upon subsequent ovulation, based upon the theory that ovulation rarely takes place during pregnancy. Additional evidence is to be found in the practice among breeders of cattle, namely, the manual expression by the rectum of persistent corpora lutea in the ovaries of cows which have failed to come into season, this is usually followed by the onset of "heat," thus showing that ovulation has occurred. The persistence of corpora lutea in the human ovary may account for some conditions of sterility due to insufficient ovarian activity, and it may be suggested that in cases of abortion where the cause is unknown the trophic influence of the corpus luteum may have been altered in character or diminished in amount.

The *interstitial cells* have been found to have an important function in the production of ovarian secretion. They are enlarged during menstruation and pregnancy (Lane-Claypon. Wallart and Seitz. Regaud and Dubreuil.) Atrophy has been observed in ovaries at the menopause. Limon found that grafted ovarian tissue maintained its secretory function if the interstitial cells persisted. I have confirmed this statement by numerous experiments upon rabbits. It is a matter of much uncertainty as to whether the interstitial cell secretion acts in conjunction with that of the follicles or is inhibitory to it. It is most probable that the ovary elaborates more than one secretion. The interstitial cells may be concerned more with the nutrition of the genital organs and their cyclic changes, and the corpus luteum with the

preparation for and development of the ovum together with metabolism as a whole. Noël Paton regards the interstitial cells as the connecting link between the soma and the gonads.

If the ovaries are removed *before puberty* there is arrest of the development of the other genital organs, and the individual retains the more infantile type as far as these organs are concerned. There is delay in the ossification of the epiphyseal cartilages causing an increase in length of the long bones (Biedl.). These observations are the result of experiments upon female animals before full sexual maturity has been reached. As a matter of clinical observation we sometimes note that deficient ovarian secretion, as evidenced by amenorrhea or delayed menstruation, occurs in tall girls, and that in cases of precocious sex development the patients are stunted in growth. Removal of the ovaries experimentally in animals shows little change upon growth and nutrition generally (Marshall). Increase in the length of the long bones after castration may not be due to the removal of ovarian secretion alone, but to increased secretion on the part of the pituitary released from the inhibitory influence of the ovary. Removal or disease of the ovaries is sometimes followed by somatic changes which have the appearance of the loss of feminine characteristics. Marshall suggests that the masculine characters are latent in the female and are only controlled by the presence of ovarian tissue. Statements such as these require further proof. Considerable stress has been laid upon the influence of the ovaries and other internal secretory organs in the development of secondary sex characteristics. This is a matter of some controversy. There is no doubt that these organs in-

fluence development to a considerable extent, and in proof of such we observe defective sex development in cretins and precocious sex development in male children due to tumors of the suprarenal cortex (Glynn). Tumors of the ovary in girls are sometimes accompanied by precocious sex development which disappears after removal of the pathological condition. If the ovaries or other internal secretory organs play such an important part in the development of secondary sex characteristics, how do we explain such cases as those patients who are normally feminine to all outward appearance and character, and yet on examination show absence of ovaries or even the presence of testicular tissue? It seems only logical to accept the view that sex determination takes place at the time of the conjugation of the reproductive cells by the character and distribution of the chromosomes. The internal secretory organs may modify the sex characteristics but at least they do not determine their onset in every case. Steinach's experiments would go to prove that the secretion of the male and female gonads is specific in character. He grafted ovaries upon previously castrated young male guinea-pigs and found that they developed female characters such as enlargement of the mammae and structural changes in the skeleton. These experiments have not been confirmed by other workers to any extent. Removal of the ovaries in young animals therefore acts chiefly upon the other reproductive organs, causing an arrest of development of the uterus, external genitals and mammae.

Removal of the ovaries *after puberty* causes atrophy of the genital organs but the changes are less marked. Menstruation ceases, and in the human individual,

various psychical phenomena occur. Removal of the ovaries disturbs the physiological equilibrium of the other internal secretory organs, and as a consequence alterations take place in metabolism. Loss of ovarian function by removal can be maintained or restored by transplantation of small pieces of ovarian tissue from the same individual or from one individual to another. This has been found of benefit in gynecological practice. The permanent effect of such transplanted tissue, as far as my own results are concerned, is seldom obtained. Those of us who have made use of such methods agree that there is a modification of the menopausal symptoms which are frequently experienced as the result of removal of both ovaries in young women, and until we find a satisfactory ovarian extract we should consider the advisability of transplantation in gynecological cases. As a result of the increase in knowledge of ovarian function, the total extirpation of ovaries in young women except in cases of malignant disease is seldom carried out by modern gynecological surgeons. The effect of ovarian secretion upon metabolism is to a great extent unknown, as the results of laboratory experiments are in so many cases contradictory or incomplete. It is difficult to make observations upon the human individual as far as reproductive functions are concerned, as the length of time for any appreciable metabolic alterations to manifest themselves would be so prolonged. Some work has been done in connection with the menstrual function but much further investigation is necessary. It is agreed that fat deposit takes place after oophorectomy, and that there is a decrease in the gaseous interchanges. These conditions are most probably the result of diminished energy. The results of researches upon the metabolism of the or-

ganic and inorganic substances are still too controversial to merit much comment.

During pregnancy the ovaries were formerly supposed to be inactive. Prenant and others maintained that this inactivity was controlled by the presence of the corpus luteum. Later researches show histological changes in the ovary during pregnancy, such as enlargement of the interstitial cells, and compensatory hypertrophy of one ovary if the other be removed (Bond). These observations point to some functional activity. There is a close correlation between the ovary and the decidua but the nature of this is unknown. Premature expulsion of the ovum is much more frequent before complete formation of the placenta than after. It may be that the interstitial cells have a trophic influence upon the ovum, as abortion cannot be produced by the application of X-rays (Kelen), which are said to cause atrophy of the Graafian follicles. It may be supposed that the ovary acts in conjunction with the other ductless glands in the maintenance of the physiological equilibrium during pregnancy as well as at any other time during the reproductive life of the individual.

During pregnancy marked changes take place in the mammae and secretion of milk occurs after parturition. These changes have been said to have been due to ovarian influence, but lactation has occurred in several cases where oophorectomy had been performed during pregnancy. Changes in the mammae during pregnancy are most probably due to the influence of secretion from the ovum. Lactation occurs as the result of the removal by parturition of some products of the ovum which are inhibitory to milk secretion.

Enlargement of the mammae occurs at puberty and sometimes during menstruation, and regressive changes take place at

the menopause. In some cases we observe painful swelling of the breasts before the onset of menstruation, showing the presence of a toxic substance in the blood generated under the influence of ovarian secretion. Secretion of milk, apart from pregnancy, although known, is not to be considered as a normal physiological process.

There is an intimate relationship between the ovary and the uterine mucosa. Bond asserts that retained uterine secretion has an effect upon the functional activity of the ovary, and that estrus is prolonged. In a series of laboratory experiments upon the removal of the uterus, and others upon retention of secretion by ligating the horns of the uterus, in no instance did I find any histological evidence of changes having taken place in the ovary. The relationship between the ovary and uterine mucosa is of importance from a clinical standpoint. Before and during menstruation (pro-estrus) considerable changes take place in the uterus as the result of stimulation from the ovary by means of its secretion carried to the blood stream. What the nature of such changes may be we are in ignorance, except in so far as histological changes have been observed. During menstruation, as the result of the breaking down of cells and capillaries there is an exudation of blood and mucus from the uterus containing in their substance a non-coagulable ferment or ferments the nature of which is unknown. Menstruation, therefore, is the elimination of catabolic products preparatory to the reception of the ovum. The solution of the problem lies in the investigation of the menstrual fluid by chemical methods. Is there a substance generated directly by the ovary into the blood stream and eliminated to a certain extent by means of the uterine mucosa or does the uterine mucosa, under the influence of the ovary,

undergo chemical changes which have as their result the production of a secretion which is not required for the subsequent embedding of the ovum and is therefore excreted preparatory to the fertilization of that ovum? In such cases as menstrual toxemia, associated with vomiting and headache and where it is assumed that excess of ovarian secretion is present, or that deficient elimination by the uterus occurs owing to some congenital or pathological defect, we assume the presence of some unknown substances generated by the mucosa cells and having a toxic effect upon the organism as a whole. In cases of vomiting of early pregnancy, the toxic substances may arise not only from the ovum but from the chemical changes which are taking place in the decidua. In menstrual disturbances the subject is of interest in view of treatment. It is important to ascertain whether the mucosa should be treated by curettage with drainage of the cervical canal by dilatation, or whether attention should be directed to the inhibition of ovarian secretion by the administration of extracts of the internal secretory organs. In cases of menorrhagia of girls there may be excessive ovarian secretion or deficient development of the uterus. Such cases are successfully treated by pituitary extract, but it is difficult to estimate whether the glandular extract acts directly upon the uterus by means of its contractile power or whether it inhibits the excessive secretion on the part of the ovary.

#### Correlation of the Ovary With Other Internal Secretory Organs.<sup>1</sup>

That the ovary is a ductless gland is

<sup>1</sup>See exhaustive review of this subject by Blair Bell in Proc. Roy. Soc. Med., London, Nov., 1913.

proved by the continuance of its secretory function when removed from its normal position and transplanted elsewhere. From the observations of Noël Paton, Henderson and others it is supposed that the thymus is antagonistic to the gonads. Castration in the male guinea-pigs is followed by persistence of growth in the thymus. At puberty the thymus retrogresses. The thymus influences early development and this influence may be passed on to the gonads at puberty so that we cannot say that its action is altogether antagonistic but that it may be compensatory.

In pathological conditions of the thyroid and pituitary glands there are marked menstrual derangements, chiefly those associated with amenorrhea. The thyroid is found to increase in size during menstruation and pregnancy, and also in pathological conditions of the ovary. Cases have been recorded where goitre has developed after oophorectomy. It would thus appear as if the secretion of the thyroid were antagonistic to that of the ovary, and yet in cases of early menopausal symptoms due to ovarian insufficiency, the administration of thyroid extract is often of great benefit in restoring the menstrual function. In menopausal symptoms after oophorectomy it often gives relief. It is possible, however, that the action of the thyroid as a stimulant to metabolism, may act as such at the menopause where toxemia is likely to occur, just as it acts with benefit during pregnancy in cases of threatened eclampsia. In cretins there is frequently defective ovarian development, and in myxedema amenorrhea is present as a rule. The thyroid and parathyroids are closely associated with the ovary in the metabolism of the inorganic salts. Thyroid derangements occur much more frequently among women than in men

(8 to 1, Berry). In the treatment of goitre by X-rays normal menstrual function is found to be restored (Stoney). The pituitary gland hypertrophies during pregnancy and after oophorectomy. Partial removal of the pituitary in young animals means decreased growth and persistence of infantile characters. There is atrophy of the gonads, hypertrophy of the thyroid and deposit of fat (Aschner). It is said that in osteomalacia there is deficient pituitary secretion. In acromegaly menstruation is irregular, and sterility is the rule. In this disease the feminine characteristics become somewhat modified. Administration of ovarian extract is said to give relief. It would appear as if the gonads had an inhibitory effect upon the pituitary, but that these organs were stimulated by the pituitary.

The suprarenal cortex is closely related in development to the ovary. It enlarges during pregnancy and during the breeding season. It is said to be enlarged after castration. Removal is followed by atrophy of the uterus (Novak). In some cases where the reproductive organs are defective, the cortex is found to be small. The cells of the cortex closely resemble those of the interstitial and luteal cells, and they undergo corresponding cyclic changes (Kolmer). Swale Vincent believes that the cortex influences growth and nutrition as well as the development of the reproductive organs. Tumors of the cortex are frequently associated with precocious sex development in males. The secretion of the ovary and suprarenal cortex may be said to be compensatory to one another.

In the discussion of the relationships of the internal secretory organs no clear conclusions can be arrived at until much further work has been done. Removal of

one gland or set of glands by laboratory experiments does not completely prove the function of that organ or organs, as we do not know if removal means compensatory function on the part of the others, or increased secretion, owing to the withdrawal of the inhibitory effect of the organs removed. In clinical work it is difficult to estimate how far the secretion of an organ is altered by pathological changes in its character or amount. The metabolism of pathological conditions is unknown to a great extent. In those cases where there is much contradictory evidence as to function, we must assume that we are dealing with organs which elaborate more than one secretion, and that these secretions may be inhibitory in their effects under some conditions and compensatory in others. The treatment of obscure gynecological conditions which involve several internal secretory organs is of interest with regard to the therapeutic uses of glandular extracts. If failure follows the administration of one, it may be that success will be achieved by combining it with others.

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#### INTERNAL SECRETION OF THE THYROID GLAND FROM THE SURGICAL VIEWPOINT.

BY

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The surgeon is chiefly interested in the internal secretion of the thyroid gland because of its influence in producing symptoms of exophthalmic goitre and also because of the possibility of cachexia and strumipriva which may follow complete removal of the gland. Fortunately the complete removal of the thyroid is scarcely ever indicated except in the early cases of malignant disease of the thyroid, which, as has been shown by Bloodgood can sometimes be cured by early excision. Observation of several hundred cases of goitre, the majority of which have been operated upon, has led me to certain conclusions with regard to the internal secretions of the thyroid, and especially its influence in producing symptoms of exophthalmic goitre. There seems to be still a good deal of difference of opinion among students of this disease as to the importance of the internal secretions of the thyroid in producing it. Rogers and Beebe and a number of others emphasize the importance of the internal secretion of other organs, especially the adrenal bodies, the pancreas, the ovary and testicle and the pituitary, in producing the

symptoms of exophthalmic goitre. That the majority are impressed with the importance of the internal secretion of the thyroid in producing exophthalmic goitre seems to be shown by the very frequent use of the terms hyperthyroidism, over secretion of the thyroid, etc., almost interchangeably with Basedow's disease, Graves' disease and exophthalmic goitre.

The effect of an overamount of thyroid secretion can be judged from the effects produced by feeding patients large quantities of thyroid extract. Formerly this was frequently done in the cure of obesity. For over ten years I had an opportunity to observe a large number of patients suffering from chronic diseases, while connected with one of our large sanitariums as surgeon, and anyone who has had a similar experience will have observed a considerable number of patients who have been fed large quantities of thyroid extract in the treatment of obesity. If the extract is given in large doses and continued for a considerable time, these patients not infrequently develop practically the same symptoms as those of patients suffering from exophthalmic goitre. Not only is there a great loss of weight but also rather obstinate tachycardia and extreme muscular weakness with characteristic fine tremor are frequently noticed. If the treatment is continued, exophthalmos and other eye symptoms occasionally occur.

The fact that the symptoms of exophthalmic goitre may be produced in relatively healthy patients by feeding thyroid extract would therefore be one reason which would prompt us to assume that the symptoms of exophthalmic goitre are caused by an overdose of internal thyroid secretion.

Not only the feeding of thyroid extract, but the administration of tincture of iodine

and the iodides have caused characteristic symptoms of thyroid oversecretion in a considerable number of cases which have come to my notice. This leads me to speak of the use of thyroid extract and various iodine preparations for the treatment of exophthalmic goitre. This form of treatment is still somewhat frequently practiced and it does occasionally give rise to benefit, but in my own opinion it is extremely hazardous in the toxic cases. Several patients who have been reasonably comfortable before such treatment was instituted have been thrown into a very grave state by the use of thyroid extract and the iodides. In the cases in which cure or improvement has resulted, probably the thyroid secreting cells have been destroyed by the overactivity caused by administering these products; in the same way that a moderate dose of cantharides will produce activity of the kidney, but an overdose results in strangury and destruction of the secreting cells of the kidney. Of course if it were possible to destroy thyroid secreting endothelium by giving thyroid extract or iodine without danger to life, this might be justifiable, but there seems to be no safe way of selecting the cases in which this may be safely accomplished.

It is possible that some of the symptoms of exophthalmic goitre may be influenced by the internal secretion of other organs, but it seems certain that it is largely due to secretion of the thyroid for the reason that the symptoms are relieved by measures which reduce the activity of the thyroid. Rest in bed, which decreases the activity of the general circulation, also decreases the activity of the thyroid circulation and is generally recognized as one of the most valuable methods of medical treatment. The local application of cold over the heart

also helps because of its effect on the general circulation and secondarily upon the thyroid circulation. Ligating one or more of the arteries feeding the thyroid usually has a still more striking effect, while removal of a considerable portion of the gland results in disappearance of the symptoms in the vast majority of cases.

A matter which frequently gives rise to confusion in the minds of many practitioners is that the most extreme symptoms of hyperthyroidism very frequently occur in patients with apparently relatively small goitres; however when the gland is exposed on the operating table considerable enlargement will be found. On the other hand patients frequently carry a very large goitre for many years without symptoms of hyperthyroidism and in some cases there is even decided evidence of undersecretion. A study of the microscopic findings in the goitres removed makes this reasonably clear. In the normal thyroid gland we find an acinus containing a moderate amount of colloid, and with well developed secreting cells lining the acinus. In the great proportion of the very large goitres the amount of colloid contained is enormously increased and many of the secreting cells are very much flattened and do not take stain readily, showing that they are partially or sometimes almost completely destroyed as a result of pressure. On the other hand in the exophthalmic goitres the amount of colloid is generally much decreased and the cavity of the acinus filled by infolding convolutions, showing that there has been a great increase in the number of secreting cells. The rapidity with which this secretion is elaborated and thrown into the general circulation can be surmised by the activity of the circulation, the pulse in these cases commonly

ranging 50% and occasionally double the normal rate. At the beginning of the operation when the gland is first exposed it is not infrequently larger in size than after its removal. The circulation is so active that the gland may well be compared to a sponge which takes up an enormous quantity of blood; but when the blood contained in the gland has oozed out, it is a relatively small and innocent looking affair.

I have frequently compared the symptoms produced by oversecretion of the thyroid to those produced by the overuse of tobacco.<sup>1</sup> Overuse of tobacco produces grave circulatory disturbances; rapid, sometimes irregular heart action and a weakened pulse. The circulatory disturbances from oversecretion of the thyroid are very similar. The overuse of tobacco influences the nervous system, causes tremor, general unrest, sleeplessness: so does hyperthyroidism. Overuse of tobacco frequently influences vision, causing tobacco amblyopia. Although the symptoms are not exactly the same, hyperthyroidism also decidedly influences vision. Both tobacco poisoning and thyroidism also cause muscular weakness, loss of weight, sometimes nausea, vomiting or diarrhea; also irritation of the respiratory tract and frequent cough. The symptoms of hyperthyroidism can be produced in healthy persons by overfeeding thyroid extract or the fresh gland itself of sheep or other animals. It would not be considered logical to treat tobacco poisoning by the use of drugs or other therapeutic measures without stopping or at least reducing the use of tobacco. If the symptoms of goitre be produced by

<sup>1</sup> *Surgical Treatment of Exophthalmic Goitre*, by M. B. Tinker. Read before the Twenty-seventh Annual Meeting of the Oregon State Medical Association, Portland, Ore.

oversecretion of the thyroid, is it not equally logical to take measures to check and reduce the oversecretion?

Besides the evidence furnished by the fact that the symptoms of hyperthyroidism can be produced in healthy persons by feeding thyroid extract, we also know that the symptoms can be relieved by partial excision of the thyroid. It is true that the symptoms are temporarily aggravated by manipulation of the thyroid and throwing into the circulation an excess of secretion during operation, but if this stage be safely passed, the patient is invariably relieved by removal of a part of the oversecreting gland. Furthermore the symptoms are relieved by other measures which reduce the activity of thyroid circulation, such as rest in bed, local application of cold or by tying one or more of the thyroid arteries. These facts lead many of us who have witnessed the great benefits of thyroid surgery to believe that operative treatment is the only logical treatment for many of these patients.

**Conclusion.**—To sum up the evidence that thyroid secretion is the chief factor in the production of the symptoms of exophthalmic goitre:

1. The symptoms may be produced by feeding thyroid extract to animals or man.
2. Measures which reduce the activity of the thyroid circulation; rest, local application of cold, ligation of the arteries, result in amelioration.
3. Removal of a considerable portion of the thyroid gland causes the symptoms to decrease or disappear.

The encouraging feature is that in the great majority of cases the patient is permanently free from the distressing symptom complex of thyroid oversecretion, as has been shown by the results in a large number of patients who are now from three or ten years past operation.

## ADRENALIN CHLORIDE IN EXOPHTHALMIC GOITRE.

BY

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From my reading I had concluded that there was an antagonism between the thyroid and adrenals in that the one diminished blood pressure and the other increased it: the lack or degeneration of the one causing the symptoms of old age with accompanying arteriosclerosis, the other by its excessive use causing this same end-result, arteriosclerosis.

It seemed to me that the excessive action of the thyroid in exophthalmic goitre might be controlled, and possibly cured by the use of adrenalin. Therefore I gave it in the following case:

Mrs. S., aged about 30, mother of one child, aged 10, no miscarriages. Had generally good health until four and a half years ago, when she developed exophthalmic goitre. She has had but little treatment and has steadily refused surgery. On March 3rd I was called in a hurry to see her, and found her almost dead from "heart failure," pulse very feeble and intermittent, beating only about 60 to the minute. I gave her a hypodermic of strychnia at once, and followed it with strychnia and cactus grandiflora and she rallied by the next day. This depression I think followed a severe spell of vomiting.

Her condition at this time was as follows: Eyes protruding so that lids would not meet. Goitre large and pulsation perceptible to the eye. Pulse very rapid. She was very nervous, feeling as though something terrible was expected. She had a constant headache, with occasional paroxysms of great severity, sometimes requiring a hypodermic of morphine for relief.

March 12th I began giving her solution adrenalin chloride, six drops, four times a day, at 7, 11 A. M., and 3, 7 P. M. This was dropped into a spoon, and a few drops of water added, not enough to cause swallowing, and taken into the mouth to be absorbed therefrom. *This is next to a*

*hypodermic in rapidity and certainty of action, because it is not swallowed to be mixed with the food, and perhaps changed by the digestive process.*

In a half hour from the first dose, the visibility of pulsation had ceased and the flush of her face mitigated. Pulse was steady at 120.

I examined her twenty-eight days from that time. The goitre was very much reduced. The exophthalmos was reduced so that the lids closed readily and completely. Looking down, the upper lid followed so as to entirely hide the ball from one sitting a few feet in front.

After escorting me upstairs and then answering the phone, soon after sitting down her pulse was 108.

Her nervousness was all gone, and she said she never felt better in her life.

Her continuous headache had left her after the first dose, and had not returned. She had had one very moderate headache following a shopping trip while menstruating.

From the amount of medicine consumed, I estimate that the dose, six drops, would not have measured more than four minimis.

Now, I do not consider this patient cured. I have thought perhaps if this active thyroid was held down to something of a normal action for a time, it might drop into, or rather stay in its old groove, and do its work right. Also I am not unmindful of the fact that too long continuance of the treatment may induce arteriosclerosis. These things will have to be learned by trial.

I will say, however, that if this action of adrenalin is at all uniform in exophthalmic goitre, it will furnish an excellent preparatory treatment for surgical intervention.

I am sending this report of an unfinished case now because I see the next number of AMERICAN MEDICINE is to be devoted to "Internal Secretions."

Dan Waggoner Building.

April 13, 1914.

## MEDICAL HINTS.

An eruption resembling scarlet fever may follow the administration of quinine.

In laryngismus stridulus or false croup, look for adenoids, enlarged tonsils, disorders of digestion or worms.

A saturated solution of picric acid is very serviceable in acute eczema, but of no use in chronic types.

Calcium sulphide,  $\frac{1}{4}$  grain every two hours, is very useful in beginning boils, carbuncle, or in any acute suppurative condition.

Strontium bromide is highly commended by Germain-See in fermentative dyspepsia. It is distinctly less irritating than potassium bromide and is a valuable nerve sedative, while its influence on the circulation and gastro-intestinal tract is most kindly.

Experience shows that the thoroughly ripe banana (or the less ripe fruit, after cooking), is undeserving of the unfavorable reputation which it has won in certain quarters. It forms a useful addition to the dietary, richer in nutrients and far more delicious than some of its more expensive competitors.—*American Practitioner.*

In flatulent dyspepsia, three drops of oil of cajuput on a piece of sugar or crumb of bread, taken frequently, is worth all the other antifermentatives put together. It is not only antiseptic but agreeable.—*Murrell.*

Put into a tumbler about two ounces of strong lemonade, using nearly half a lemon. Pour in the desired quantity of castor oil. Just as you are ready to give it stir in about one-quarter teaspoonful of baking soda. It will foam to the top of the glass. Have the patient drink it while it is effervescent. Even the oiliness of the dose is not detected.—"Trained Nurse."

# THE ANNOTATOR



**Physique and Success.**—The physical basis of success has been strangely neglected in medical literature, yet one has only to attend a meeting of successful doctors to be convinced that preeminence is largely conditioned by the possession of a physique which can stand the dreadful strains. Of course there must be brains to start with and these must be trained, but it does seem that a big powerful physique has been a deciding factor in the case of many successful physicians and particularly of the surgeons. This is not to say that a frail student short of stature must not aspire to leadership in surgery if he finds that his mental equipment is dragging him that way. Many men have attained eminence in every walk of life in spite of physical handicaps which would prevent the mediocre from ever making the effort. To a large extent in surgery it is the survival of the fittest as the unfit drop out and those left seem to have a remarkably high average of muscular strength, stature and brains. What is more important perhaps, is the life of almost cloistered austerity which many a surgeon is compelled to lead in order to preserve the steadiness of muscle and mental keenness so necessary in delicate operations. The world will never know the elaborate grooming some find necessary—a professional beauty could not be more careful. Nor will the world ever know the personal privations necessary, such as the omission of amusements and social affairs which seem part of man's necessities. As for any excesses, it is a matter of common knowledge that they destroy good surgery and even life itself. All medical colleges make a point of giving some special instruction on the kind of personal hygiene necessary for success, but from the way such

advice is ignored, it is not given in a convincing way, or perhaps most of us think that without some self indulgence life is not worth living. We often wonder how long it takes a surgeon to recover from the effects of the tobacco smoke which fills the rooms at meetings he must attend. We would like to mention the rather handsome appearance of many a surgeon, but in case such a remark might lead the unhandsome to an undue self-appreciation, let us add that good health frequently masquerades as good looks.

**Growth in Childhood.**—The growing periods of children have been strangely ignored though the facts are of considerable



practical value to physicians and teachers. Nearly everyone thinks that children grow gradually from birth to full maturity and that only exceptionally do they take spurts. As a fact the rate of growth is normally intermittent,

and though there is probably no time of absolute cessation of growth, there are numerous periods of great rapidity. These facts were discovered many years ago by Dr. Atlassoff from a study of the records of physical measurements of the students in the Russian Military Schools. The only reference to the matter in English is a short paragraph in a popular article in the *Strand Magazine* of November, 1900, on The Modern Russian Officer written by A. Anderson. The ages of the boys studied, varied from eleven to eighteen, and in that seven years, there were three periods of growth, occasionally four, and the greatest growth was generally in the sixteenth year. It was accidentally discovered that in these growing times, the boy was mentally dulled,

even stupid, and apparently lazy. He could not learn and effort to do so was painful and injurious. When a boy developed the symptoms and his measurements showed the cause, his mental tasks were lightened, and some of his studies replaced by mechanical employments. After the period was over he instinctively turned to his books, soon recovered lost ground and then made greater progress than those who were forced to mental labor when the brain was enfeebled by the lack of nourishment which was being taken by the other tissues. Medical literature is full of instances where minor operations, such as removal of adenoids or tonsils or the correction of misplaced teeth, have been followed by a period of growth which was attributed to the surgery, but which would have happened anyhow. Our teachers now have one reason why so many boys and girls loath school at the age of greatest growth, and occasionally before or after. Some of our ablest men were utterly unable to study for several years after fifteen and had to be taken out of school as failures. An appreciation of these facts by teachers may lead to the salvation of many a boy who leaves school to his later regret. It is a great pity that medical and pedagogic literature has so greatly ignored this important matter of mental apathy in periods of growth.

### The International Surgical Association.

—This great body of earnest workers has just finished a very profitable meeting—the



first in America—but the results are rather disappointing to the non-surgical part of the profession. Very little was presented which was really new, but perhaps the greatest value of such meetings is the discussion which brings out

the different view points of an old topic. We cannot expect a great discovery every year, but the intervening years need not be useless if we can take account of stock and discard the worn out or useless. No doubt every member is now a better surgeon for the personal contact with workers from other lands. The technical discussions on

ulcers of the stomach and duodenum, amputations and plastic surgery have placed those subjects on a much more solid basis. A really important announcement was made by Bevan of Chicago, to the effect that his colleague E. C. Rosenau had succeeded in modifying streptococci by varying the methods of cultivation, so that each of several strains thus produced acquired a different morphology and a specific effect. When introduced intravenously one invariably caused gastric ulcer, another endocarditis and another lesions of the joints. A report from Paris says that Madame Victor Henri, a bacteriologist has modified anthrax bacilli by ultra-violet light, so that it produces a disease wholly different from anthrax—probably more different than vaccinia is from variola. Here are several new fields opened up at once. We have long known that pathologic bacteria are merely varieties of ancestral forms which had no pathogenic powers, and also known that we could reduce or destroy their virulence, but now the hope is entertained that we can so change them that prophylaxis and vaccine therapy will become practical in every infection. The suggestion that gastric ulcer is always an infection does not disprove Lane's contention that a mechanical cause is necessary to place the tissues in a condition where they lose resistance to the invasion. Altogether, the meeting was memorable and America is proud that one of her leaders, W. W. Keen, was honored with the Presidency.

### The Unwarranted Claims of the Anti-tuberculous Societies.—Baseless claims by the anti-tuberculosis associations bid fair



to become a scandal unless some kind friend will gently lead them into less egotistical channels of publicity. The crusade has done a world of good, but has not altered the mortality curve a particle. Indeed, as a rule, the yearly

reductions in the death rate were greater before the crusade than since. Many have their lives prolonged but eventually die of it. Nevertheless, all over the world, the anti-tuberculosis workers are either claiming

that they have caused all this life saving since they have been at work, or have called attention to the lessened death rates in such a way as to give that impression. They have almost completely ignored the factors which reduced the death rate before their time and long before Koch's time. Their main contention is that consumption is contagious and that we must isolate the sufferers or avoid them like lepers. They are keeping up the false idea that we contract the infection in adult life, in spite of the overwhelming proof that we get it in childhood and keep it all our lives. They are therefore doing great harm for there can be no doubt that the public is not being properly instructed.

To be sure, every worker harps upon the necessity of fresh air, liberal nutrition and every other factor of good health. They do not impress upon every man that he is tubercular already and that this small lesion is a necessity as it keeps him immune to more virulent invaders through constant auto-vaccination. They must harp upon the fact that the only way to lose resistance and become consumptive is by living improperly, eating improperly and drinking improperly. It is not enough to live a sober, Godly and upright life, but the main thing is the hygienic life, not a cowardly flight from a harmless consumptive. Of course we must keep our children out of danger until Nature makes them strong enough to withstand it. Above all, we must tell the adult residents of "consumptive houses," that they did not get their infection there, but brought it with them, and that the place is so unfit to live in that it has brought the disease out.

*The public must be told that sanitation reduces the tuberculosis death rate by preventing the infections which cause a reduction of our tuberculosis immunity. There will then be a demand for more sanitation and no complaints as to the cost. Then we will see the rate go down to its irreducible minimum. As we have frequently stated the submerged tenth will never be able to buy proper food and these underfed folks furnish most of the cases. A little calculation will convince everyone that the world does not produce enough food for the proper nourishment of all. Whenever we increase the output, a new lot of babies at once appear, there is the same relative*

deficiency and the under dogs go hungry. The total extinction of consumption may not occur until the millennium. The anti-tuberculosis workers are constantly telling us that much of the trouble is found in the huge families of those who are unable to feed their babies. Instead of calling for help to raise infants who are destined to be as worthless as their parents, why not popularize ways of avoiding pregnancies. Many thinking men both here and in Europe are preaching from that text, and protesting against the present efforts to raise the worthless. The last absurdity is the chart put out by the Boston Association implying that the modern reduction of the death rate beginning in 1882 was due to Koch's discovery of the bacillus in that year. As a fact his announcement was not a factor in alleged prevention for over a decade, and 1882 marks the beginning of the effect of scientific sanitation which was born only a few years before. Similarly the Swiss are claiming that the establishment of sanatoriums is responsible for the reduction of their death rate, though it began to come down long before there were any sanatoriums and the present ones can accommodate only a fraction of the cases.

#### **Equal Suffrage and the Uplift Movement.—**

The moral tone of equal suffrage communities is once more illustrated by the recent election in Seattle. That city possessed a mayor named Hiram Gill, who was an open champion of liquor and prostitution. He even established two municipal brothels on a public street, but the "moral sense" of the community was so outraged that he was "recalled" by the aid of 22,000 female voters. His chief of police was imprisoned for grafting on the underworld. This city has now voted Hiram Gill into office again after four years of retirement. That is, the claim that women will uplift a city if possessed of the franchise is not true. We have rather been of the opinion that votes for women were sure to come throughout the civilized world, and that it will be a good thing, since the total vote



will then express public opinion better than at present. But it is evident that the voteless women have always had a share in creating the moral tone of the community, which tone is not altered by conferring the franchise. It is also evident that the majority of men and women of Seattle now have exactly what they wish. That is, some women are just as bad voters as some men. Both sexes are of the earth, earthy. Neither can claim more civic virtue than the other, no matter what their relative moral codes may be in other matters. It is good to know how bad Seattle is, and we extend to her our sympathy, in the full knowledge that we are just as bad as she is. The trouble with us in New York, is the fact that the few of us who are pious and moral want to legislate for the great majority who are not as good as we are, and the women won't help us.

temporary fluctuations in food production the world over, and people constantly migrate from starved areas as in the days of Joseph. In the long run, the world's population invariably impinges on the *available* food. Even in food producing countries, like the United States, the inefficients go hungry while food is exported to better men abroad who overbid us, but both in Europe and America about one-tenth are at or below the poverty line—intermittently unable to secure proper nourishment. In times of prosperity the birth rate instantly rises and extra babies keep the tenth down as before. Every grocer knows that the market does not contain sufficient nitrogenous food to feed all the incipient consumptives correctly. Some must die by the very laws which preserved their ancestors at the expense of the inefficients of that day. Life is a warfare for existence and he who lives by the sword must die by the sword.

### **Is Our Food Supply Diminishing?**

The alleged increasing shortage of food is worrying a lot of good people unnecessarily.

They seem to think that a hundred years is not long enough to prove the falsity of the dismal predictions of Malthus. The last ones to take the matter seriously are the Committee on Statistics of the Chamber of Commerce of the United States of America.

Curiously enough, they have taken a much shorter period of 1899-1909 to show that vegetable foods have increased in that time in the United States faster than the population, wherein they are just as much in error in one direction as Malthus was in the other. If these commercially minded people are correct, food will become so cheap that farmers will not get enough for their crops to buy salt, and will abandon food raising until the lessened supply raises prices enough to warrant taking it up again. Not one of these investigators seems to know that the matter regulates itself automatically. Malthus is to be excused, because nothing was known in his day as to the biologic law known as the struggle for existence, but these latter-day dilettanti should know better. There are



**The Development of Speech.**—This is a subject that has been occupying the attention of anthropologists, but it has very practical bearings in psychiatry. We have long been of the opinion that articulate speech was a very late phenomenon. Man had to develop a big brain to survive in that awful period of stress in the increasing cold of pliocene time which culminated in the glacial period. It has generally been assumed that he did not need speech until later when it was evolved by ordinary selection of those who could communicate with each other that way and do better team work, in hunting the mammoth for instance. Woodward of the Kensington Museum concluded that the early skulls showed that articulate speech was not yet possible, but Keith concluded that the speech centers in the brain did exist in the pliocene brain a million or more years ago. There may not have been more than a hundred words or so, but that may have been enough for their primitive needs. Since then the parts have undergone enormous evolution in complexity as the language itself developed. In certain diseases, deterioration attacks the mental faculties in the inverse order of their

evolution, and it is therefore not surprising that some speech is left in very late stages of dementia. A study of this fading of speech will surely reveal evidence of the manner of its evolution as also seen in its development, since children epitomise adult stages. Mere babies talk long before the brain has reached nine-tenths of its adult size. Keith is right. Perhaps man's evolution was impossible without cooperation of his fellows in groups, and he must have been able to communicate ideas orally even in the pre-human stage. All gregarious animals do it. The missing links were probably possessed of real spoken language.

### **Spurious or Adulterated Chaulmoogra Oil.**

This may not appeal to us as an important item of news, but it may be a matter of life and death to lepers if the real oil is a specific. Dr. Ernest E. Francis, Chief Medical officer of the Assam-Bengal Railway has reported to the *Lancet* that the crop of seeds furnishing the oil was a failure in 1912 and that most of the oil on the market is obtained from other sources.

Nothing in the world is more fiendish than the substitution of inert for potent remedies and one stands almost aghast at the impossibility of detecting the fraud. Can we not insist upon some guarantee from the seller? Otherwise how are we to know that any drug from the Orient is really what is on the label? We must not blame bad results on a drug unless we are sure we are actually giving it.



conspicuous success, both from the point of view of attendance and of the quality of the papers read.

Dr. William J. Mayo of Rochester, Minn., took the subject of cancer for his presidential address. He said in part, that chronic irritation was the most important cause by far of pre-cancerous conditions in human beings. Referring to the value of radiography for diagnostic purposes, he said that in cancer of the stomach the radiologist had been able in 100 consecutive cases to make a definite diagnosis in 87 per cent. of the patients. The best that had been accomplished by other means was 67 per cent. This method of diagnosis he would certainly place first in such cases while he would be inclined to place it second in value among the modes for diagnosing obstructions of the duodenum. He emphasized the point that among civilized peoples cancer of the stomach forms one-third of all cases of the disease while nothing like this proportion was observed among primitive races or among the lower animals. He wondered then if there was some fundamental fault in the food that civilized men ate or in the cooking which gave such a preponderance to cases of precancerous conditions in the gastric region. Dr. Mayo concluded that the prevalence of cancer was due probably more to the quantity of food eaten than to the quality. He thought that in accepting the theory that cancer was caused by chronic irritation in a large proportion of cases, and because of the fact that cancer of the stomach was the most prevalent form, the logical conclusion was that overeating was a predominant cause of the disease. Several skiagrams of malignant growths of the gastric region were exhibited which demonstrated that usually gastric ulcers were caused by irritation and later became malignant. Some radiographs were shown in which cancer had originated and developed without previous ulcers or other growths having been in existence. On the question of treatment of cancer, the majority of those present appeared to be somewhat strongly of the opinion that the only effective method of treatment known so far was operation as soon as possible. With regard to treatment of malignant growths by radium Dr. Richard Sparmann of Vienna, a member of the clinic of Dr. Anton von Eiselsberg, read a paper on the subject. Dr. Sparmann said in part, that 42 cases of malignant tumor had been treated by radium at the Eiselsberg clinic. Of this number 17 died, five from other causes than tumors; 6 were benefited, 5 cases showed no effects, 14 cases were positively aggravated. According to Dr. Sparmann the experiments in Vienna showed that radium was effective only in superficial cases of malignant tumor and even then it was effective in no marked degree. Radium had actually made worse many bad tumors by destroying healthy tissues around them so that there was nothing left to check the tumor's spread. There had been no specific change in tissue by radium, and it did not appear that it would ever replace operation in the treatment of cancer. The hopes that had been placed in radium had not been realized.

### **SPECIAL ARTICLES.**

#### **THE CANCER PROBLEM DISCUSSED AT THE ANNUAL MEETING OF THE AMERICAN SURGICAL AS- SOCIATION, HELD IN NEW YORK.**

The annual meeting of the American Surgical Association, which took place at the Hotel Astor, New York, on April 10 and 11, was a

Dr. Robert Abbe of New York made a stout defence of the therapeutic effects of radium on cancer, declaring that in his opinion radium exerted a special action on certain forms of malignant growths. However, the views of Dr. Sparmann, based on experimental work with radium in the treatment of cancer appeared to coincide with the views of most of the audience as the result of similar experience. Early diagnosis and prompt surgical interference according to Dr. Mayo, was the only effective means of curing malignant growths and this expression of opinion seemed to be generally accepted as fairly stating the situation as regards the treatment of cancer.

## GASTRIC AND DUODENAL ULCERS DISCUSSED AT THE CONGRESS OF THE INTERNATIONAL SOCIETY OF SURGERY.

At the triennial meeting of the International Society of Surgery which was held at Hotel Astor, New York, from April 13-16, only three subjects were discussed. The technique of amputations, gastric and duodenal ulcers and grafts and transplantations. The papers and discussion on gastric and duodenal ulcers were very full and the latest views on the matter from some of the foremost authorities of the world were clearly set forth. Dr. F. de Quervain of Basle dealt with diagnosis of gastric and duodenal ulcers.

Drs. Hartmann and Lecene of Paris said in part, that although duodenal ulcer was certainly more frequent than it was formerly supposed to be they nevertheless thought that its frequency had been exaggerated and in France, at the very least, they had noticed on the average one ulcer of the duodenum to eight or ten ulcers of the stomach. They were of the opinion that the clinical criteria (symptomatology described by Moynihan), and the anatomical (pyloric vein) given as characteristic of duodenal ulcer, were far from being above criticism; they considered that the symptomatology described by Moynihan was simply that of pyloric spasm while as for the pyloric vein, it was very unreliable as regards situation and disposition. Posterior gastroenterostomy, performed on the pyloric cavern itself, at its most sloping point seemed to them to be the most suitable operation in all cases of juxta pyloric ulcers, stomach or duodenal.

Dr. W. J. Mayo, Rochester, Minn., considered chronic ulcers of the stomach and duodenum and in the course of his paper said that from 1906 to 1914 at St. Mary's Hospital, Rochester, the relation of the clinical symptoms to the lesion came to be better understood. The Röntgen ray took the first place in the diagnosis of these lesions, the value of the purely laboratory examination of gastric contents was found to have been overestimated, and the necessity for the excision of gastric ulcers because of the menace of cancer, was recognized.

Mayo thought that gastrojejunostomy was the most generally useful operation for gastric ulcer and had a wide field of application. While posterior gastrojejunostomy was the operation of choice, in certain cases adhesions might prevent its use. In these cases the anterior operation had given good results.

Sir Berkeley Moynihan of Leeds, England, who was to have read a paper, was not present.

Dr. E. Payr of Leipsic after dealing with the etiology and pathogeny of gastric and duodenal ulcer, their variety and the manner in which they sometimes degenerated—observing that ulcer of the duodenum rarely showed a carcinomatous degeneracy—described at length the technique for operation. It was interesting to note in describing the operations which in his opinion were the most suitable for different varieties of ulcers, that in every case he recommended operation by a German method. The only technique he referred to not German was that of Finney and he was very non-committal as to its merits.

The discussion that followed the reading of the papers was exhaustive. In fact, the matter was threshed out in a fairly thorough manner.

Dr. Arthur D. Bevan, professor of surgery at the University of Chicago, pointed out that the investigations of Dr. Edward S. Rosenau, professor of pathology at the same university, bade fair to elucidate the origin of gastric and duodenal ulcer. Dr. Rosenau has published recently results of some experiments whereby he has shown that certain strains of bacteria when cultivated in different mediums underwent change or transmutation. He has also shown that endocarditis can be produced in animals by injecting intravenously, bacteria cultivated in a certain medium. He has also produced inflammatory infectious lesions of the joints by the injection of a variety of streptococci which had undergone transmutation. Lastly Dr. Rosenau had produced in animals gastric and duodenal ulcers by injection of streptococci taken from other ulcers of the same nature. Therefore Dr. Rosenau has concluded that a particular strain of bacteria has a particular selective action for some particular tissue and as Dr. Bevan pointed out this was very suggestive and might lead to the discovery of the true etiology and curative treatment of gastric and duodenal ulcers. The discussion on gastric and duodenal ulcers was so long and covered so many points that it cannot be considered with any degree of completeness in this report.

Dr. Rodman of Philadelphia believed that although patients suffering from these ulcers made an operative recovery too frequently they were not cured and he was therefore of the opinion that even more radical treatment was often indicated.

With reference to Rosenau's work Mayo pointed out that while Rosenau has produced acute ulcers in animals he has not produced chronic ulcers and he, Mayo, had found in his experience that acute ulcers very seldom became chronic. Mayo also drew attention to the fact that the base of an ulcer of the stomach or duodenum was not found to be car-

cinematous, so that it may be inferred that the malignant growth was grafted on.

Among those who took part in the discussion were Dr. J. B. Murphy of Chicago, Dr. Howard Lillenthal of New York, Dr. A. P. Gerster of New York, Dr. Willy Meyer of New York, Dr. A. Ochsner of Chicago, Dr. M. Bloch of Copenhagen, Dr. Sonnenburg of Berlin, Dr. Kummell of Hamburg, Dr. Lambotte of Brussels, Dr. Ullmann of Vienna, Dr. Soffotitch of Belgrade, Dr. Manniger of Budapest and Dr. Krynski of Warsaw.

## COMPLIMENTARY DINNER GIVEN BY DR. WILLIAM SEAMAN BAINBRIDGE.

On Monday evening, April 13, a dinner was given at the Hotel Biltmore by Dr. William Seaman Bainbridge of New York in honor of Dr. Eugene Hertoghe, Brussels, member of the Academy of Medicine, Belgium, of Alfred C. Jordan, M. D., Cantab. M. R. C. P., London, Medical Radiographer to Guy's Hospital, London, of Benjamin Merrill Ricketts, M. D., LL. D., Cincinnati, and other distinguished European and American members of the medical profession. There were present in all about one hundred and ninety representatives of surgery and medicine drawn from Europe and from the whole of America, including some from the uttermost parts of the continent. Before the dinner an informal reception was held by Dr. Bainbridge when the guests were presented to Dr. Hertoghe, Dr. Jordan and Dr. Ricketts. The dining room was tastefully arranged and the proceedings passed off with the greatest smoothness, a result largely due to the tact of Dr. J. D. Malcolm of the New York Skin and Cancer Hospital, who was responsible for the arrangements. On the dais with Dr. Bainbridge were Dr. Hertoghe on his right and Dr. Jordan on his left, Dr. Ricketts, Dr. Ernest LaPlace of Philadelphia, Dr. C. E. de M. Sajous of Philadelphia, Dr. Jabez Jackson of Indianapolis, Dr. J. A. Wyeth of New York, Dr. Robert T. Morris of New York.

Several speeches of a social nature were made, Dr. Hertoghe especially distinguishing himself as an after-dinner speaker, making many witty remarks, apt allusions and happy and humorous hits. Dr. Hertoghe also gave a lecture on the subject he has made so particularly his own, that of hypothyroidism and held his audience deeply interested while he described the symptoms and treatment of thyroid deficiency. The address was beautifully illustrated by pictures on the screen.

Dr. Jordan gave an exposition of the radiography of intestinal stasis, his address and lantern slides holding the rapt attention of his hearers. Dr. Ricketts gave a most interesting lecture with explanatory illustrations of wounds of the heart and pericardium. It goes without saying that Dr. Bainbridge was an ex-

cellent host, and he proved himself to be in this capacity almost as able as he is with the knife. The thanks of all present were heartily voted him for a delightful evening which happily combined social enjoyment with instruction.

Among those present were Dr. J. R. Alvarez, Dr. Anthony Bassler, Dr. Paul Bartholow, Dr. Carl Beck, Dr. J. A. Bodine, Dr. R. A. Brennan, Dr. G. L. Brodhead, Dr. S. P. Beebe, Dr. Rolla Camden, Dr. D. Bryson Delavan, Dr. W. G. Doremus, Dr. Henry Eichorn, Dr. R. S. Fowler, Dr. J. R. Goffe, Dr. Ramon Guiteras, Dr. William Van Valzah Hayes, Dr. J. B. Huber, Dr. A. M. Kane, Dr. W. M. Leszynsky, Dr. Frank Lewis, Managing Editor *International Journal of Surgery*, Dr. W. H. Luckett, Dr. Alexander Lyle, Dr. J. M. Lynch, Dr. A. S. Morrow, Dr. H. L. Northrop, Dr. E. W. Petersen, Dr. G. G. Pfahler, Dr. J. T. Pilcher, Dr. A. J. Quimby, Dr. A. R. Robinson, Dr. John Rogers, Dr. H. Edwin Lewis, Editor of AMERICAN MEDICINE, Dr. P. J. Rosenheim, Literary Editor of *International Journal of Surgery*, Dr. L. L. Seaman, Dr. I. A. Stoff, Dr. C. T. Southers, Dr. Martin B. Tinker, Dr. W. W. Van Valzah, Dr. J. C. Vaughan, Dr. Ralph Waldo, Dr. Claud L. Wheeler, Editor *New York Medical Journal*, Dr. O. S. Wightman, Col. C. E. Woodruff, U. S. A., co-editor of AMERICAN MEDICINE, Dr. Gustave Zinke and many other prominent medical men.

On the morning of Tuesday, April 14, a lecture on Internal Photography as an Aid to Diagnosis, illustrated, was given at the New York Polyclinic Medical School and Hospital by Alfred C. Jordan, M. D., Cantab. M. R. C. P., Medical Radiographer to Guy's Hospital and Royal Hospital for Diseases of the Chest, London. Dr. Jordan, who is one of the greatest masters of medical radiography in the world, gave an exceedingly interesting and instructive lecture on X-ray technique, dealing more particularly with the intestinal tract, which was illustrated with some really magnificent radiographs. Dr. Jordan pointed out by means of internal photography, the manner in which bismuth meals serve to show with remarkable accuracy, that is in the hands of an expert, the condition of the intestines by which a diagnosis can be made and a decision reached as to whether or not a radical surgical operation is indicated for the relief or cure of intestinal stasis. Dr. Jordan held the attention of a large audience whilst he demonstrated the practical value of these diagnostic methods in a clear and forcible way.

On the morning of Wednesday, April 15, at the same hospital, Dr. Eugene Hertoghe of Antwerp gave a striking lecture and demonstration on hypothyroidism, with stereopticon pictures. Dr. Hertoghe, as is well known, is a pioneer in this branch of medical science and he ably upheld his reputation, both as an authority and a teacher. Perhaps, the part of Dr. Hertoghe's lecture which most impressed his audience was that in which he described how he almost stumbled upon the fact that hypothyroidism was a fairly frequent condition and that symptoms which were generally ascribed to other diseases, notably to Bright's disease, were really due to thyroid deficiency.

However, as a paper appears in the present number from the pen of Dr. Hertoghe himself it will be superfluous to enlarge on a lecture which was replete with interest from beginning to end.

On the morning of Thursday, April 16, at the same hospital Dr. Benjamin Merrill Ricketts of Cincinnati, O., gave a lecture and demonstration on the surgery of the heart and lungs. Good wine needs no bush and in a like manner the work of Dr. Ricketts needs no eulogy at any rate to American medical readers. Dr. Ricketts gave a convincing lecture and demonstration on the subject that he has made so greatly his own and showed that in the hands of a skilful, well trained operator, the heart itself and its immediate neighborhood, is not so sensitive to injury as it is usually supposed to be. Dr. Ricketts gave a practical demonstration on an anesthetized dog. In connection with this demonstration reference was naturally made to vivisection and the anti-vivisection movement. Dr. Ricketts himself stated that he was lover of all animals and that in the course of his numerous experiments, he acted invariably in the most humane manner possible.

Dr. Bainbridge in the course of a few remarks on the same subject made a very appropriate comment on the anti-vivisectionist campaign. He said that standing in the building which holds the tomb of Pasteur in Rome, one noticed that on the frescoes of the walls were depicted various animals while an inscription read "Here lies Pasteur surrounded by his friends." Dr. Bainbridge declared that those opposed to any kind of animal experimentation should take these words to heart. It was not only the human race which benefited by experiments of this nature but the entire animal kingdom. Pasteur proved this and that was why they placed him when dead in a building surrounded by the animals for whom he had done so much.

On the morning of Friday, April 17, at the same hospital, Dr. Albin Lambotte, surgeon-in-chief of the Stinvenberg Hospital, Antwerp, should have held a clinic and given a demonstration on the treatment of fracture. Dr. Lambotte was unable for reasons over which he had no control to fulfill his engagement and in his stead Dr. John A. Wyeth gave an excellent demonstration on the treatment of burns. Dr. John A. Bodine operated for the radical cure of hernia. Dr. Alexander Lyle demonstrated the treatment of fracture and Dr. William Seaman Bainbridge spoke on cancer. He also exhibited cases, one of which was that of a child 12 weeks of age which had suffered from malignant tumor of the breast and axilla. Dr. Bainbridge made a complete amputation of the breast and the child was well three months after. He exhibited a patient on whom a plastic operation for facial deformities following cancer had been performed. Dr. Bainbridge also operated for an extensive cancer of the neck, with complete dissection. Altogether this clinic was most interesting and profitable to the large number of physicians present.



**Treatment of Erysipelas.**—Dr. Aspinwall Judd, of New York, according to the *Medical Summary* (Jan.), recommends carbolic acid as being almost a specific in erysipelas. A strong solution is painted on the surface until it whitens and then is followed by swabbing with alcohol. The treatment should go an inch beyond the border of the eruption to destroy all germs. The unbearable itching, burning and throbbing are relieved at once, fever declines and the general symptoms are relieved. The author states that he has treated successfully 67 cases and five cases in which it failed. No scarring results. The superficial layers of the skin come off as in mild sunburn and the complexion is improved.

**The Treatment of Osteomyelitis.** Dr. Warren A. Dennis of St. Paul adds another contribution (*St. Paul Med. Jour.*, Dec., 1913) to the crusade started by Peter Daniel of London as to the far reaching effects of suppurations of the orifices of the body, and the extreme necessity of curing up what appear to be very minor affections. Of course middle ear disease is far from a minor complaint by physicians, but the laity still neglect it wofully.

Treatment consists simply in evacuating the pus when its presence is evident, and healing is prompt. Curetting the cavities is not necessary and would probably be harmful.

There is one point in the treatment of osteomyelitis which the writer believes to be of the utmost importance, and yet one to which he has never seen any reference made, either in the text books or the literature. That point concerns the treatment of the etiologic factor. We are told that the disease results from infection from some primary focus, such as furuncle, carbuncle, paronychia or chronic ulcer. The importance of suppurative middle ear disease has apparently been entirely overlooked and yet an inquiry into the history of all the cases coming under observation during the past two years shows that a large percentage, especially in children, had suffered from suppurative otitis media. Granting the correctness of this observation, its importance can hardly be overestimated; first, because it shows the necessity for competent treatment for this condition whenever found; second, that of taking care of any active process that may be there present at the time of operating upon a case of osteomyelitis; and finally the prime importance of early care of those two great causes

of suppurative middle ear disease, inflamed tonsils and adenoids. The reason that active suppurative osteomyelitis is so often multiple and consecutive is that while the first bone involved is treated the infecting focus is allowed to remain undisturbed and often even unsuspected. The importance is therefore emphasized of determining whenever possible the primary focus of infection and subjecting it to efficient treatment.

The points which it is desired to emphasize in this brief sketch are as follows:

1. The importance of searching in the acute case the real seat of infection, namely, the medullary cavity.
2. The mistake that is commonly made in the acute case of curetting out the medullary cavity.
3. The great value in the chronic case of the use of the Mosetig iodoform wax plug, provided it is used according to Mosetig's directions.
4. The necessity for searching for and discovering whenever possible the primary source of infection and eliminating its activities.
5. The frequency with which the primary source of infection will be found in the middle ear.

## GENERAL TOPICS

**An Innovation for the Care of Genito-Urinary Patients.**—A new annex to the Long Island College Hospital has been constructed on Amity Street in Brooklyn, and is now open for the reception of patients. This annex is unique, as it is the only hospital in Greater New York where a patient with syphilis, or gonorrhea and its complications, can receive the benefit of hospital treatment on payment of a moderate sum. The cases of this character requiring hospital care have hitherto been forced, from lack of other accommodations, to enter the public city hospitals and become objects of the city's charity. This annex, solely for venereal diseases, consists of a pavilion two stories in height, separated from the main hospital, and contains accommodation for sixty male patients. It is a fireproof, concrete building, heated by steam, lighted by electricity, and of sanitary construction. The two main wards, which are sixty feet by forty-two feet and fourteen feet in height, have large windows with ample light and air on three sides. It is arranged so that entire separation of the two classes of patients is maintained, the upper floor being for gonorrhreal patients and the

lower floor for syphilitic patients, with complete equipment of dressing-rooms, toilet and bath rooms on each floor, and with separate dining-rooms. The medical and surgical treatment is under the direction of Professor Henry H. Morton and Doctors Homer E. Fraser and J. Sturdivant Read, and a special interne from the house staff of the Long Island College Hospital, whose exclusive work is the genito-urinary service.

**The Physician As a Business Man.**—The *Medical Summary* discusses this subject editorially and states that while there are many physicians who are shrewd financiers and money grubbers, the rank and file of the profession are not prosperous financially and, sad to relate, many are rated by business men as dishonest. Doctors, above all other men, seem to have a knack of getting head-over-heels in debt. At heart they are perhaps honest and sincere, but too often they are disposed to live and buy on the prospect of future collections. All doctors think they are going to make more money next year than this, but they seldom do. Some one has aptly said that we can always divide by two the money we are going to receive. The far-away hills look greenest. If doctors could collect their bills in the way they should there would be less complaint along this line. Unfortunately, many of them fall into the same dilatory ruts that their undesirable patients are in and form the habit of standing off creditors.

Physicians, perhaps, have many excuses for being dilatory in financial matters, but excuses do not justify our course of conduct. It pays the physician always to make no more bills than he can promptly meet and then meet them. There is something incalculably satisfying about knowing that one's credit is good.

The man whose credit is good never wants credit. That is something to ponder over. Credit is usually like all other virtues—an abstract thing which we are seldom called upon to use.

We believe that much of the financial stress experienced by medical men might be avoided if they would practice a rigid economy and live within their incomes. Dispensing doctors often buy lavishly because of the siren song of the retail man. While the doctor must read and advance himself if he would succeed, yet he often buys absurd medical books that are good only for (costly) ornamentation.

There is one sort of debt which should be assumed by the doctor who is struggling to make ends meet. After locating in a community where future prospects seem fairly good he should purchase a home and start payments thereon. He will then have an end to which he can work in earnest. The doctor who invests in a piece of real estate, be it ever so small, will start to acquire business sense and will not fritter his money away on things that give him no adequate return.

# American Medicine

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PUBLISHED MONTHLY BY THE AMERICAN MEDICAL PUBLISHING COMPANY.

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Complete Series, Vol. XX, No. 5.  
New Series, Vol. IX, No. 5.

MAY, 1914.

\$1.00

YEARLY  
in advance.

**The hospital situation in New York City** is admittedly so bad that nothing short of a radical reorganization will remedy the defects. Perhaps it might be better to say that an organization must be created, as there is no co-ordination at present among the 111 public or semi-public institutions of which we have knowledge and the more numerous private hospitals and sanitariums not listed. It is an open secret that some private institutions are sadly in need of regulation by some one endowed with legal power to enforce reforms. Whether this official body shall be under the Health Department or be independent is immaterial to this discussion, though much may be said for and against each system. The point is merely that some one must have power to end the present murderous inefficiency. No doubt those institutions which are financed by private individuals, churches, or other associations will bitterly resist any restrictions on their American freedom to do as they please, but that is to be expected. We all recognize the fact that the restoration of the disabled, while once a family affair, is slowly becoming the duty of the social organism for its own protection and efficiency. The money will be raised somehow, and if it is not supplied voluntarily by those who think they have some to spare, it will be taken by legal means from those who we know have

more than is good for them or for society. The day of greedy accumulation of useless wealth has passed.

Those who have too much, have charged too much for their wares or have taken an unearned increment and must refund to society. So we need not worry about the future expenses of hospitals—indeed the cost per bed will be far less than now, even in institutions that are using their present equipment to proper advantage.

**The abolition of special hospitals** is urgently needed. There is absolutely no use for a cancer hospital or one for the ruptured and crippled, when such cases can be treated more cheaply and just as well in the surgical ward of a general hospital by the same men. Similarly an eye and ear hospital is an expensive absurdity, though we are perfectly aware that the trustees of such institutions will be horrified by this charge. We have excellent authority for stating that an effort will be made to abolish all the special hospitals for infectious diseases except small pox. A child with measles, for instance, is far better off in an isolated ward of a general hospital where it can get the services of any kind of specialist its complications demand. The present system is a relic of the pre-scientific days when there were no specialists

and one man could supply all the available skill for any case. This is the day for cooperation, as no man can be expert in more than a little sphere. When specialism first appeared, it was assumed that a specialized worker was still good enough to dispense with the services of any other. We now hear of dreadful mortality in some special hospitals from the lack of this co-operation. Probably the greatest need in New York City, is the "open hospital" to which any family physician can take his cases if the home is improper. He knows the cases better and can surely treat them better than one who has never seen them before. This system is becoming universal in the smaller towns. The present staff method has great advantages no doubt but it is dying out because of its disadvantages. The "close corporation" of the ordinary hospital staff smacks of commercialism. Of course, the operating room must not be open to every Tom, Dick and Harry, but the medical nurses can carry out the treatment of a family physician. The minds of those who are thinking on the subject seems to be in the direction of a large general "open" hospital for every district of the city and the abolition of all special hospitals. Even the institutions for tuberculosis would have to be classed as general hospitals with means for treating any complication.

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**The overworking of nurses** is at last receiving long needed attention. The public became horrified at the railroad disasters due to the mental fatigue of overworked engineers, and restricted their hours by law. There is no telling what may happen to a sick man if his nurse is so tired that she cannot think clearly. Wherever

possible, the "three shift" method is being adopted, but in the majority of hospitals it is charged that overworking is still the rule. Must it too be prohibited by law? The invariable excuse is poverty and lack of nurses. There are plenty for the purpose, if they are confined to professional work and relieved of duties which can just as well be done by maids, scrub women and orderlies. The health of the nurse herself must be guarded as much as the welfare of the patient. The short professional life of nurses is unquestionably due to the desire to escape the exhausting drudgery which they instinctively recognize as more or less lethal. The death rate of nurses is not nearly so high as it formerly was, and we can impute this to their greater care in handling infectious diseases, especially typhoid fever and diphtheria. Yet we understand that sickness and death are still too frequent. The reduction of the hours of work and the abnormal strains will unquestionably improve matters still more. In their rundown condition they are liable to catch anything which comes their way. It is strange that physicians who are so careful to prevent strains and exhaustions in others, have been so neglectful of their own assistants.

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**The dangers of whooping cough** are at last receiving the attention they deserve. A few physicians have been writing of the matter for many years, but they have been like lone prophets crying out in a wilderness of indifference. The profession is at last aroused and we expect that a concerted effort will now be made to convince the public that this affection is not the trivial matter most mothers think. It kills 10,000 children a year in the United States and

if we add the deaths from later complications and tabulated as bronchitis, pneumonia or tuberculosis the total is really appalling. It kills more than typhoid, yet we dread it less. No doubt the older children mostly recover, but the case death rate is said to be 25 per cent. in those less than a year old, and most of the mortality is of children less than five. These facts must be explained to the public, to stop the criminal habit of exposing babies to the disease "to have it over with." There is no longer any doubt that the cause is the bacillus found between the cilia of the tracheal and bronchial mucous cells, and called the Bordet-Gengon bacillus though Spengler described it in 1897—an instance, by-the-way, of the old habit of professional neglect of the discoveries of our pioneers. This delicate organism perishes very promptly after expulsion from the host, so that infection is generally if not always spread by spray or droplets coughed out. That is, a carrier is necessary, and we must put an end to the universal carelessness with which mothers take their sick children into crowds to infect and kill others. In time we will consider this a crime warranting the confinement of mother and child in a municipal quarantine station.

**The quarantine of whooping cough** suggested by Dr. J. L. Morse of Boston (*Journal American Medical Association*, May 31, 1913) though an ideal to be hoped for in the future, seems a little too severe for the present state of public opinion. There must be a campaign of education first, to convince people of the seriousness of the situation. The section on Pediatrics of the New York Academy of Medicine has taken the matter up in earnest, with a view of suggesting to the

Health Department, some measures which are practicable now. The present need is for special wards for the hospital cases and segregation centers for uncomplicated cases. This is a large order for a large city, and though we cannot get all we ask, a half loaf will be better than none. There is a suspicion that we are not doing as much as we could with the means at hand, and a big reform on our part is quite possible. We have surely been negligent in failing to keep the laity informed as to the dangerous character of the disease, but we must not go to the opposite extreme of imposing galling restrictions on the family. It is easy to create a public opinion which will insist upon notification and isolation. Exclusion from school for six weeks after the paroxysmal stage is practicable now. There is, by-the-way, a remarkable parallelism to tuberculosis in the way that immunity is gradually acquired. Is the city child constantly being inoculated with attenuated pertussis bacilli which in time protect it from virulent doses? No matter how this is done, we do know that the longer we prevent these virulent doses, the lighter is the disease and in time there is complete immunity.

**The vaccine treatment of whooping cough** is already a practicable therapy. Sill of New York has cured cases in an average of  $4\frac{1}{2}$  weeks with a mixture of pertussis bacilli, micrococci catarrhalis and staphylococci aureus, and has stated that larger doses than he gave might have been even more efficient (AMERICAN MEDICINE, June, 1913). Dr. Alfred Conor of the French Army, whose untimely death has recently been reported, developed a living vaccine at the Military Hospital in Tunis in collaboration with a Doctor Nicolle.

They cured 37 per cent. in 3 weeks, greatly improved 40 per cent., and failed in 23 per cent. though no ill results were noticed. Emile Roux, Director of the Pasteur Institute in presenting the matter to the Academy of Medicine last June, thought that it was possible to perfect a vaccine which would promptly cure all cases. The Pasteur Institute is committed to the use of living vaccines which have been so weakened or sensibilized that they are promptly taken up by the phagocytes. It is claimed that immunity is more effectively and more quickly caused than by dead bacilli. These sensitized bacilli do not multiply to cause a separate disease, as in the case of vaccinia due to attenuated smallpox germs, but act like the original disease germs without causing any disease. The staff are certainly very successful with sensitized streptococci and staphylococci. Metchnikoff has expressed great doubts as to the value of the dead typhoid vaccine, and great claims are made for the sensitized, living typhoid vaccine. Hence we must accept the optimism as to the possibility of a living vaccine which will promptly cure whooping cough.

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of mercury. Recently, Fournier, his predecessor in the chair of syphiliography in the enormous clinic at St. Louis Hospital, has testified that Gaucher had the merit of being the only one who saw the facts clearly and in opposition to the whole medical profession. Gaucher now says that salvarsan actually retards the disease and prolongs the period of contagion. We were so credulous as to the cure by one dose that the reappearance of the lesions was considered a re-infection, but for these late symptoms he now invents the term "*chancre redux avec roséoles de retour*." He daily sees grave cases which had had their disease made latent a long time. As for the alleged cases of cure in the earliest stage before lymphatic involvement, he sweeps them all aside with the assertion that nothing is more difficult than an early diagnosis, and these "cures" were evidently not syphilis at all, for he constantly sees such early alleged cases get well without treatment. He says that when the disease is evident, sterilization has never resulted from the drug. These facts were presented to the Congress of London in July, 1913, and have not been refuted. He says that they never had so much syphilitic meningitis as since the introduction of salvarsan and that this complication is a drug intoxication. The spirochetes are "mobilized" by "606" and provoke nervous disorders not seen otherwise; but which are becoming daily more common. He concludes that salvarsan is a dangerous, often fatal poison to the nervous system, that it never cures syphilis, that the ulcerous lesions it cures habitually return, and that it makes the disease more grave. All these facts have induced some Germans to petition their Government to prohibit the sale or use of the drug, and while we think

**Does Salvarsan Retard and Aggravate Syphilis, and Is It a Dangerous Poison As Well?**—This startling charge is made by Professor Gaucher, according to the *Gazette des Practiciens*, Apr. 1, 1914, which quotes from his article in *La Clinique Infantile*, Mar. 15, 1914. It will be remembered that in 1910 he was the first to notice that though the drug had a remarkable cicatrizing power, it did not cure the disease which still necessitated the usual prolonged course

such a course unwise, it is well for the profession to take notice.

**Early Claims of New Drugs are Often Wrong.**—We consider it necessary to refer once again to our editorial of Dec., 1911, referring to the statement (*N. Y. State Journal of Medicine*, Oct., 1910) that salvarsan "sterilizes the entire infected body with one single injection in less than twenty-four hours." We repeat this to emphasize what we then said, that laboratory experiments which are invaluable and indispensable, must not be permitted to settle a question of therapy or prophylaxis, until therapeutists and sanitarians have tried it out. We are now going through the same painful experience with anti-typhoid vaccine as we did with salvarsan. One hospital which adopted inoculation in 1908 for the nurses has not had a case of typhoid among them since, with an average of ten per cent. unprotected. These ten per cent. have somehow escaped infection and it is evident that many if not all the 90 per cent. have also avoided it by precautions ignored before 1908. So we are in ignorance of the actual amount and duration of their immunity. The honors given to the vaccinationists may be as unwarranted as the hysterical praises showered upon Ehrlich. Indeed there is a beginning reaction on account of the way the injurious results have been overlooked in both salvarsan and typhoid vaccine. Dr. Wm. Gilman Thompson of New York City has reported three cases of typhoid fever in persons who had been inoculated less than a year, two in eight months and one in four months. (*N. Y. Medical Record*, May 16, 1914). This shows that the immunity may be very evanescent, and that the vaccine can never

take the place of sanitary precautions. The egotistic claim of the vaccinationists that they are accomplishing what is really done by sanitation after the immunity fades is most dangerous. Public safety demands the publication of the truth and all the truth as to what is reducing typhoid fever and what dangers accompany the vaccines. Partisan reports have no scientific value particularly if they are known to suppress anything.

**Baseless doubts of the lasting immunity conferred by vaccinia** were expressed by Dr. A. W. Lescohier of Detroit at the section on Public Health of the American Medical Association at the Minneapolis meeting last June. (*Journal*, Aug. 16, 1913.) Luckily, all those who discussed his paper disagreed with him, and showed that in times of epidemics the cases are almost entirely from the unvaccinated part of the population, and that in the very few who do get smallpox in spite of vaccination, the interval had been very long, and they rarely die of it. Moreover it was shown that it is exceedingly difficult to get a typical vaccinia in a person who has once had it. We can go a step further and repeat what we have said before, it is exceedingly difficult to get any response at all in those who had been previously successfully vaccinated in several places. If only one insertion is made the immunity to vaccinia wears out in many years when a typical vaccinia can again be produced by vaccination. The speakers called attention to the fact that the immunity to smallpox lasts much longer than the immunity to vaccinia and that the vaccinated were often safe even if the new vaccination did "take." The old theory that if it "takes" it was needed, is not always cor-

rect. Yet if it does "take," the person is generally safe for life,—at least there are no known exceptions. We must again call attention to the fact that many alleged successful revaccinations are nothing more than infections having no relation to vaccinia, and the statistics on the subject are worthless. An "unusually sore arm" may not confer the slightest immunity but be merely a streptococcic invasion, and revaccination soon after might cause typical vaccinia. Leschier garbled some remarks in these columns of Feb., 1913, and we are glad he was so thoroughly shown to be misinformed.

**It is a dangerous thing to cast reflection on the lasting immunity to smallpox conferred by vaccinia properly induced by several insertions** or even on the protection conferred by a single insertion. We have troubles enough in convincing people of the wisdom of submitting, without manufacturing doubts from within the profession. Dyer of New Orleans wants to vaccinate repeatedly until no vesicle forms, but after a proper vaccination, an immediate revaccination does not cause vesicles, and besides the people would not tolerate it. He too is casting unwarranted suspicions on vaccination which confers so much immunity in spite of the carelessness with which it is done. He may be right in wishing to stop the process after vesiculation to prevent the later pustules, but that is another story. Whether it will do any good to open the vesicles and treat antiseptically, remains to be seen. It might be said here that soldiers and sailors not infrequently prevent vaccinia by washing off the lymph and some have later contracted smallpox thus casting unwarranted doubt on the protective power of vaccinia. The newspapers have reported

that the women nurses in a Middletown hospital have been washing their vaccination wounds with bichloride solution to prevent "taking." Perhaps they are resenting unnecessary revaccinations.

**The alleged mismanagement of typhoid** is the charge brought by the Bureau of Municipal Research, against the Health Department of New York City. So much of the report as has been published gives the impression of exaggeration of defects and unwarrantable conclusions. It is no doubt true that in time typhoid fever will be exterminated, but no one will believe that it would have been possible to have prevented the 1913 epidemic by the means at hand in 1911. Some if not all the reforms suggested by the Bureau have been demanded time and time again by sanitarians but refused by those who hold the purse strings. Indeed we understand that most of the suggestions in the report originated in the Department of Health, though the impression has been given that the Bureau devised them as an adverse criticism of that department. On the whole the report is very welcome because it shows what laymen think of the possibilities of sanitation. We have been so loudly preaching about its past accomplishments that our facts have sunk into the public consciousness, and we are now expected to do a wee bit more than we have bargained for. Since middle ground seems too slippery for most critics, it is far more satisfactory for sanitation to be considered superhuman than to be held in contempt. We are quite sure the recommendations of the sanitarians will be given more consideration hereafter and the conquest of typhoid fever hastened.

**The proper control of incipient insanity** is a problem which must be solved, as it has been discussed long enough to convince the public of the necessity for some change. The safeguards for the patient are so complete that there is now little dread of the possibility of the confinement of normal men by conspirators, while the attempted assassination of prominent men has convinced people that their own safeguards are not nearly complete enough. So we may soon expect to hear new demands for an earlier recognition and incarceration of the irresponsible. We were led to expect great things of the psychiatric clinics when they were established some years ago, and doubtless they are doing good in the way of preventing mental breakdown in such cases as they may reach, though very little is being said of their work. The present problem is one of devising ways of reacting the cases which do not get to the clinics, men who have never committed any offense bringing them to the notice of the police. We must confess to a feeling of hopelessness at the difficulty of keeping track of people in a country where there is no registration and each man can go where he pleases. Recent occurrences may result in depriving the police of some of the power they possess already, and we cannot have a new class of officials nosing around on a still hunt for crazy people. Our alienists are therefore facing a popular demand which cannot be complied with. Assassination of valuable public servants by normal people cannot be prevented in Europe in spite of all precautions, and we have a similar burden as to the unrecognized insane. This seems pessimistic, but perhaps we deserve our fate as a punishment for the recklessness with which we have excused and even glorified murder. The insane merely reflect the ideas

of the period, so the character of their delusions and impulses changes from age to age. When murder becomes unpopular and is invariably followed by loss of life or liberty, we will find fewer homicidal cases among the insane and the fear of death will act as a deterrent as long as any inhibition exists. Perhaps if we reform ourselves it may not be so urgent to detect and control incipient insanity. The people already demand the execution or confinement of murderers, but will they go a step further and demand the confinement of those who express a desire to do murder? We may once have been compelled to murder competitors to live, but that time has passed so long that the impulse ought to have faded. Unfortunately it has not, and is only suppressed into subconsciousness by later developed inhibitions. Its expression is therefore a sign of degeneration or disease warranting deprivation of liberty. Civilized men fit for liberty should never have a desire to kill except solely in self-defense and then only when restraint of the aggressor is impossible. Is it too soon to put these ideas to practical use? Let us hear from the psychologists as well as the alienists.

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**Publicity of medical discoveries in lay journals** must be thrashed out all over again, because the Association of American Physicians is reported to have refused to hear a paper the content of which had been mentioned in the daily press without the author's knowledge. Dr. Henry Plotz, a young pathologist of Mount Sinai hospital, thinks he has found the living cause of typhus and that Brill's disease is a form of this fever. Perhaps he is correct—epoch-making discoveries are generally made by mere youths,

like Schaudin, who are persecuted by those who are too old to discover anything except wrong-doing in others. We cannot help thinking that the refusal to hear him—if the report to this effect is true—was not the part of wisdom. It certainly has elicited some very cutting and perhaps deserved criticism, which the whole profession must share. The vast majority of physicians learn of such new things in medicine from the daily papers, but wait for accurate details until the technical paper appears in a technical journal—often a matter of some months. If the facts were not mentioned elsewhere they would come to the attention of only those few men who happen to see that particular journal. This is the way that Mendel's great discovery was lost for over 20 years to the enormous injury of medical science. An honest effort is being made by some leaders of the profession to take the public into our confidence, but it seems that the reactionaries are in control, and that the majority are still wedded to the old medieval aloofness from the common herd—an aloofness demanded by the mysticism of the orthodox practice of those days, but wholly out of place now. There seems to be a growing demand for accurate medical information in the lay press which reaches those who never see medical journals. It will certainly be far wiser for American physicians to devise some way of filling this urgent need, instead of joining the obstructionists, who do nothing but criticize every attempt at reform and place the whole profession in a false light. It is said of a great European investigator that under no circumstances will he ever tell what he is studying. He merely publishes results when he is finished. Dr. Plotz has acted the same way but perhaps it would have been better not to have said that his future work will be the discovery of a serum.

**First Aid Dentistry** is the title of a little book written by First Lieutenant E. P. R. Ryan, Dental Surgeon, U. S. Army and recently published by P. Blakiston's Son and Company. These remarks are not a book review nor an advertisement, but a comment on something unusual and of great value to all practitioners who haven't a dentist next door. It is only a few years ago that the medical profession began to realize the far reaching and serious consequences of "minor" suppurations of the mouth and adjacent cavities. Dentists on the other hand had been calling attention to the matter for a long time, but we were all inclined to consider it too trivial for the attention of people occupied with duodenal ulcers and the "major" operations. Then we were awakened by such men as Peter Daniel of London, who showed that the major conditions were often the results of the minor things we had so atrociously neglected, and we have at last got the habit of calling in the dentist to cure serious, even lethal bodily conditions by simply removing the cause. The isolated doctor, on land or sea, at once felt the need of some authoritative advice as to what to do until a dentist could be reached—and the need has now been filled. The author states that the work is intended merely to show what can be done to relieve dental pain until a dental surgeon can complete the treatment, but in reality it is more. It places in the hands of the country doctor the means of curing some who would not or could not visit a dentist. Many a city doctor, too, will find himself occasionally in a position where "a stitch in time saves nine." No treatment, surgical or medical, can be perfect if we continue to ignore the pus in the mouth, and every practitioner would be better off if he knew

what ought to be done, even if he refers the case to some one else. Great oaks from little acorns grow, and a fatal illness not infrequently starts from an extensive suppuration due to tartar which might easily have been removed before it did any appreciable harm. The day of prevention is here, as we have frequently mentioned in these columns. We therefore commend this little book, but hope that its readers will not consider themselves competent to eliminate the dentist entirely, but merely to make his later work more effective.

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**The physical and mental deterioration caused by tropical climates** has been studied a great deal of late, with a view of determining the causes. Everyone knows that there are dozens of factors and the present investigations have the object of finding out which do the most harm. Dr. Weston P. Chamberlain of the Army, (*The Philippine Journal of Science*, 1911) said that the main causes were the infections and that heat and humidity doubtless played some part through discontinuing outdoor exercise. He said that those who stay indoors suffer most but "men who spend much time entirely engaged out of doors in the Philippines are the ones who remain in the best of health," yet for a century or two the British have been saying the exact opposite of tropical India. Now comes another opinion from a board composed of Drs. Ashburn, Vedder and Gentry studying tropical diseases in Manila. They accuse heat and moisture, and call attention to the widespread fallacy that those who escape infections in the tropics are not hurt by anything else. They assert that though a man may never be sick in the tropics, his

mental and physical vigor may be "greatly impaired by prolonged exposure to heat." Perhaps this is the reason we get such contradictory and absurd ideas from the tropics. Dr. Freer, the head of the Bureau of Science, actually stated (*Philippine Journal of Science*, Jan., 1912) that the climate was harmless, and yet he died of its effects a few weeks later. Every little while we learn of another such death in Manila. Dr. Washburn, whose resignation from the Civil Service Commission has recently been accepted by President Wilson, stated some years ago (*Amer. Jour. of Med. Sci.*) that no one would get sick in the Philippines if he was moral and sober, and yet he himself collapsed in a few months and had to go away to get well.

The recent death of Lieut. Col. D. D. Gaillard, the brilliant Panama engineer, has been blamed on the climate, and yet the chief sanitary officer, Col. Gorgas, has repeatedly asserted that the climate is harmless if the infections are prevented, and that a great white population can live permanently in Panama. It is now time to supplement the sanitary measures that have been directed against the infections, by hygienic instruction as to the dangerous factors in the climate and how to avoid them.

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**The proposed school of surgery** of the American College of Surgery has been discussed a great deal of late. The need of it seems to be taken for granted, as though the post-graduate schools were not doing all they might do to turn out skilled operators. The usual method is to tell the student what is to be done and then do it in his presence, letting him obtain the necessary skill at home. Of course most if not

all the students have a certain degree of skill already—some to a very high degree. They merely want to see what other men are doing or they want to witness some operations which they have read about but do not like to try until they have seen it done. Here and there the student performs certain operations on the cadaver and living animals, and thus attains sufficient skill to start in actual practice, but it seems likely that the best course is to serve as assistant to an operator. Not everyone can be given that opportunity but all teachers have long realized that they must make it practicable. We doubt whether one school of surgery or a dozen of them will be able to do any better than those already established. If every hospital surgeon were a member of the teaching staff of a school, and were compelled to make up his own operating staff from students who had already been trained on the cadaver and lower animals, there would be a chance for every graduate whether he became an interne or not. A special diploma in surgery would of course be given only to those who spend a year or two in the operating room staff. We have the men, the material and the operating rooms, but do not use them for teaching purposes and yet we whimper about our inability to give practical training to every student. If the proposed school of surgery will organize and use our present unquestionable resources in a proper and practical manner to develop capable surgeons, it will justify its establishment in short order.

Fahr. for 20 or 30 minutes—renders it to any extent unsuitable for infant feeding, is once again being debated in Great Britain. There are those like Dr. Eric Pritchard who hold that cooked milk is a food on which infants thrive, and owing to his wide experience, his views are entitled to the greatest consideration. On the other hand, many British medical men contend that pasteurization while destroying the tubercle bacilli if present, and those of the lactic and coli group, at the same time so removes some of the nutritive properties of the milk, that it is unable to maintain proper nutrition of the infant. Indeed, the strong opponents of pasteurization go so far as to assert that milk thus treated is to a certain extent devitalized, and that children fed from birth on such food are invariably more or less ill nourished and prone to contract disease, especially tuberculosis. This statement, however, does not appear to be borne out by the experience of those in charge of municipal milk depots and places of a similar character. The chief advantage claimed for the pasteurization of milk is that it is a dependable safeguard, particularly against the contraction of tuberculosis. Perhaps it may be said that the whole matter hinges on the point of the danger of bovine tuberculosis to the human species. The evidence with regard to this is still of a confusing nature. Many authorities are of the opinion that the danger from this source is a negligible quantity and others think that tuberculous milk is a serious menace to the human race. Statistics differ widely regarding this important phase of the question. For instance, Dr. A. Philip Mitchell of Edinburgh published in the *British Medical Journal*, January

**Is Pasteurization Essential.**—The question as to whether pasteurization of milk—which as usually understood consists of heating it to a temperature of 150° to 160°

17th last, a "Report on the Infection of Children with Bovine Tuberculosis" and stated that out of 72 cases examined, in 65 or 90 per cent, the bovine bacillus was present, and in 7 cases or 10 per cent., the human bacillus. If similar findings were the rule, the argument in favor of the pasteurization of milk would be incontrovertible. Fortunately, they are the exception rather than the rule and as the situation stands at the present time, there can be no doubt that the majority of the medical profession hold the opinion that the amount of bovine tuberculosis conveyed by milk does not bulk very large.

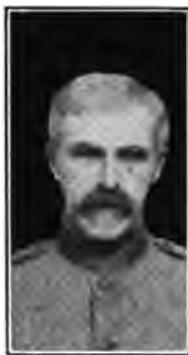
**There are many obvious drawbacks to pasteurization,** and it is not, as a few of its most enthusiastic advocates would have us believe, an ideal method. It may be a fact that properly pasteurized milk is the most valuable makeshift or temporary substitute for mothers' milk or for fresh cows' milk that has yet been devised. This is the best that can be said for it, for even if for the sake of argument we agree that bovine tuberculosis is a real menace, and that pasteurization does not lower the nutritive properties of milk, the process notwithstanding has certain manifest disadvantages. Thus too often it engenders a false sense of security. Pasteurization to be a real safeguard against infection and pollution must be done thoroughly. Who can say in any but the exceptional case that it has been done thoroughly? Commercial pasteurization, speaking generally, has been shown to be not only open to question but often a hopelessly futile procedure lulling the people into a feeling of security, when as a matter of fact in too many instances

the dangers are aggravated after milk has been pasteurized, since it requires much greater care than before undergoing the process. How many of the lay population understand or act upon this fact? Another charge which may be brought against pasteurization, is that, believing milk so treated to be a perfectly safe food, mothers are more liable than ever to think it unnecessary to nourish their infants at the breast. Nowadays, in all classes there is a growing disinclination to fulfill this one of the most important duties of motherhood. The slightest excuse for evading this maternal responsibility is seized upon with avidity and the consequence is that this nation is fast becoming a nation the great majority of whose infants are artificially fed. Pasteurized milk is one excuse for this evasion. Recent investigations have shown conclusively that an animal to thrive at its best should be fed for some considerable time after its birth with milk derived from one of its own species. As compared with this conclusion it is of quite minor importance, whether an infant is brought up on pasteurized or unpasteurized cow's milk. "Back to the breast", might well be suggested as a suitable slogan in the present campaign for healthier babies. The ideal food for an infant is mother's milk, failing this pure fresh cow's milk, with pasteurization as an emergency procedure when unavoidable conditions make it necessary or desirable. But it must be always borne in mind that in every case, if pasteurization is not properly done, and the milk strictly cared for after the process, it is not only worse than useless, but may be the source of the very evils it is intended to prevent.



## MEN AND THINGS

**Colonel Daniel M. Appel, Medical Corps, U. S. Army**, died unexpectedly and suddenly at Honolulu, April 22, 1914, in the sixtieth year of his age.



He was a native of Philadelphia and was graduated from Jefferson Medical College in 1875, and subsequently served as clinical assistant to the elder Gross. He entered the Army Medical Service in 1876, and attained the grade of colonel in 1908, being at the time of his death, the second ranking officer of his corps. He has always been a noted figure from his great professional ability and geniality, and had acquired a host of friends who are greatly shocked at his untimely end. He was a recognized authority on tuberculosis, to the literature of which he contributed many valuable articles. He is best known as the builder and organizer of the Army Tuberculosis Hospital at Fort Bayard, New Mexico. He leaves a widow, and one son, Robert G. Appel, who is a civil engineer in Colorado.

**The card index system of the New York City Public Library** deserves more than a word of praise. A member of our staff had occasion to refer to an article published some years ago, but had forgotten the title, name of author, name of journal and its date. The contents and character of the article were described to a bright young woman in the Russian section of the Library, who found the article in less than five minutes. As the matter is of considerable importance, the good accomplished will repay a thousand fold the time, labor and expense of indexing every article under many different headings. In addition, cards

automatically group themselves together by subjects, so that upon looking up a matter one often runs across much information indexed from articles whose titles give no indication of the variety of contents. We congratulate the public library upon the invaluable card index which has been created and which is constantly growing.

**Are men wisest at sixty?** Ex-President Taft is reported to have said so, and also that a man takes sixty years to recognize his own defects and by that time he knows so much that he wishes to help the young avoid the mistakes he himself has made. We wish Mr. Taft would reserve publication of such opinions until he is sixty.

**Invitations to lay reporters to attend medical meetings** are opposed by some members of the New York County Medical Society—at least invitations extended by those who are to read papers and wish to advertise the matter to the lay public. We must confess our inability to see in this practice the evils which others see. Indeed we would go to the opposite extreme and insist upon the presence of lay reporters at all meetings. We have nothing we wish to conceal from the public—if we did have, we should be ashamed to present it to an exclusive meeting of doctors. On the other hand, everything of sufficient value to occupy the time of busy practitioners at a medical meeting is not only of intense interest to laymen, but they should be informed for their own good. The public must be taken into our confidence and not held at arm's length as the half-quacks of the middle ages did. Those were the days when mystery was the basis of therapy—

nowadays the patient wants to know the reason why. It may be true that a little knowledge is dangerous, but the old ignorance was a disaster in comparison. Besides our plain duty is to supplement the little knowledge by more to make it less dangerous. Physicians do not seem to realize the public's thirst for medical knowledge, presented in terms they understand. Lay journalists have a genius for detecting new medical facts of keen interest and we might as well confess that many a physician gets his first knowledge of important scientific advances from the short dispatches in the daily papers. The article itself reaches only the few subscribers to the technical journal in which it is published. Abstracts of it appear in many other journals, but are buried in a mass of worthless truck which no busy man can sift through to find the pearls. Of course errors are made, largely by the hasty head-liners who do not intelligently read the article itself, but the harm done is negligible in comparison with the good. The French Academy of Medicine seems to be the rendezvous for lay reporters, and when something new is presented, thousands of daily papers throughout the world inform millions of families within 48 hours. Why cannot we do likewise, instead of behaving as though we were ashamed to have the public know about what we are doing? Let there be a press table, like the press gallery of legislatures, to be vacated only when executive business is transacted.

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**Goldsmith the Physician.**—The proposed plan to place a statue of Oliver Goldsmith in some appropriate place in London meets with widespread approval. And in paying this late honor to a great man English speaking physicians will recall with deep sympathy the trials and tribulations he knew as a medical practitioner in London before his final success in literature was achieved. Goldsmith reached London in February, 1756, says an editorial writer in the London *Lancet*, Mar. 7, 1914, after a somewhat mythical tour in France and Italy. He was then in a state of utter destitution, and with difficulty, we must suppose, managed to become a chemist's assistant on Fish-street Hill, near the Monument. Later

on, through the kind help of a Dr. Sleigh, he set up as a physician upon the opposite side of the river. Here he told a friend that he "was doing very well," but he was in a tarnished dress and a shirt a fortnight old. Reynolds once told an anecdote of the care with which Goldsmith at this time carried his hat so as to hide a patch in his coat. He tried all kinds of other employments, from that of usher to that of printer's reader, but returned as a *pis aller* to the medical profession, for which he had so little gift and for which he was at this time not "qualified" as the word is now understood. In December, 1757, he writes to his brother-in-law Hodson that he was making shift to live by a "very little practice as a physician, and a very little reputation as a poet." In August, 1758, he wrote three letters to friends in Ireland, begging them to get him subscribers for his forthcoming book, "On the Present State of Taste and Literature in Europe." The MS. of one of these letters was reproduced in 1858 by the modern representative of Griffin, Goldsmith's original publisher. It probably has often been torn from the collected editions of Goldsmith printed by Griffin in 1858, and has deceived the unwary collector of autographs. In this letter, which is addressed at great length to Mrs. Lawler, *née* Contarine, the cousin with whom poor "Goldie" had been in love in Ireland, he gives an account of his penury, none the less poignant for its tone of persiflage. He intends, he says, to adorn his room with "maxims of frugality." "These," he continues, "will make pretty furniture enough and won't be a bit too expensive, for I shall draw them all out with my own hands, and my landlady's daughter shall frame them with the parings of my black waistcoat. Each maxim is to be inscribed on a sheet of clean paper and wrote with my best pen, of which the following will serve as a specimen: 'Look sharp. Mind the mean (*sic*) chance. Money is money now. If you have a thousand pound, you can put your hands by your sides and say you are worth a thousand pounds every day of the year. Take a farthing from an hundred pound, and it will be an hundred pound no longer.' Thus which way soever I turn my eyes they are sure to meet one of those friendly monitors, and as we are told of an actor who hung his room round with looking-

glasses to correct the defects of his person, my apartment shall be furnished in a peculiar manner to correct the errors of my mind." The sale of his book was to pay for his passage to Coromandel, where, through his friend Milner, he had obtained the position of physician and surgeon to a factory. His practice was to bring him in £1000 per annum, but evidently he was expected to qualify first. He must have been familiar with Smollet's description of an examination at Surgeons' Hall in "Roderick Random," but undeterred by this he presented himself before the examiners and was disqualified. The examiners were probably Messrs. Mark Hawkins, Fullagar, Nourse, Girle, Singleton, and Roul. The entry in the Royal College of Surgeons "Examination Book" under date Dec. 21st, 1758, states that before a Court of Examiners, held at the theatre, James Johnson was "appointed apprentice to Mr. Carson, Thomas Meggs qualified for surgeon to a regiment, James Bernard Mate to an hospital, Oliver Goldsmith, found not qualifyd for Do." At the same court four naval surgeons were also appointed. The poet, we now know, afterwards obtained the M. B. of Dublin (probably before 1761), and of Oxford in 1769. His medical career in London, however, seems to have ended with his failure at the Royal College of Surgeons of England. He became famous in literature, even at a time when he was playing the flute to the ragged children at the foot of Breakneck Steps leading to his lodgings in Green Arbour Court. Sixty-eight pages are now devoted to his works in the British Museum Catalogue.

attention to Jacobi's recent article in AMERICAN MEDICINE, showing the necessity of alcohol in the severe toxemia of diphtheria. The most recent testimony of that sort is given by Crozier-Griffith who has found it very dependable in lobar-pneumonia of children. His article (*Medical Times*, Jan., 1914) is so short and good that we gladly quote from it as follows:

"Lobar-pneumonia or fibrinous or croupous pneumonia as it occurs in children, who form, naturally, the greater bulk of my patients, is generally a disease with a very favorable prognosis. Nearly all the cases of what has appeared to be fatal croupous-pneumonia in children are probably, instances of broncho-pneumonia of the pseudo-lobar type. The necessary conclusion is that the most important thing is to avoid over-dosing of the child, and to make efforts to help nature in the control of the disease, and not impede it.

I use hydro-therapy, oftenest in the form of warm tub baths, if the high temperature is attended by nervous symptoms. If these are not present, the temperature apparently does little damage. I do not urge food very greatly. I use cardiac stimulants, such as digitalis, caffein, and the like, should occasion require. I put more dependence, probably, upon alcohol than any other drug of this class. This in no way means that I think alcohol is necessary for every case. Cough requires a sedative only if very annoying; and then I do not hesitate to use opiates, provided there is no marked tympanitic distention of the abdomen. Should this symptom be present, opiates make the condition worse, with increase of dyspnea, and impairment of the circulation by the upward pressure of the gas. Counter-irritation of any kind I believe to be entirely unnecessary; unless the case happens to be complicated by severe bronchitis. Such a complication is, however, more likely to occur in broncho-pneumonia."

In the same journal in an article by Dr. Wm. A. Jenkins of Louisville, Ky. on the treatment of broncho-pneumonia he mentions the necessity of dissipating a bronchitis before it becomes a pneumonia, but "after the pneumonia is once established, however, and we have the temperature, the difficult breathing and the marked systemic disturbance, the story is very different. We should then direct our attention to the

**The re-habilitation of alcohol as a drug**  
is another of those amazing changes in professional opinion. To be sure there are numerous practitioners who long ago saw the benefit of alcohol and knew when it was needed. These men have depended on it and used it right along in spite of the fanaticism of the antis in the profession. A lot of us used it too often, in too large doses and in cases not needing it, but that was our fault, and should not have led us to abandon the drug when it was needed in proper amounts. We should have learned our business better. We need only call

problem of preventing the thick, tenacious, inflammatory exudate from plugging up the small bronchial tubes and shutting off the air. This causes the greatest amount of trouble in these cases. I employ such remedies as will act through the blood, as infants and children do not expectorate material from the lungs.

In my experience the drugs that are most useful in this particular respect are apomorphin combined with strychnin nitrate in dosage at intervals according to age. For a child two years old I would give one 1/120 of a grain of strychnin nitrate and 1/60 of a grain of apomorphin every four hours. If there is much prostration, I believe that Cognac is the most useful remedy. For a child two years old I order a teaspoonful diluted with water or poured over a little cracked ice and given after the ice is melted, every three hours.

The iodides are useful along the same lines. In cases of cardiac failure digalen or camphorated oil are both useful and if necessary should be given hypodermatically.

I have no faith in remedies applied locally to the chest, unless it be a simple jacket for the chest, lined with absorbent cotton, to maintain an even temperature."

All this must be wormwood and gall to those who still assert that "the value of alcohol in the physician's armamentarium is *nil*."

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**The atrocious charges of cruelty against Dr. Joshua A. Sweet of the University of Pennsylvania were accepted as true when they were made and given very caustic comment by some lay editors who should have had more sense. The trial which has now ended in a disagreement of the jury, brings to light the real facts. An hysterical woman member of the Society for the Prevention of Cruelty to Animals was made the willing dupe of a treacherous employee, who allowed her to see and misinterpret some facts. She ought to have had sense enough to know that she could not rely on the word of a traitor, but in her abnormal nervous state she was easily deceived. She said it was cruel to give the dogs nothing but sawdust beds, but the testimony showed that was the best for them. The garbage fed to them turned out**

to be the scraps from the table—the very best food for them. The neglect to bandage the wounds was because bandages are insanitary and harmful. The dog full of punctured wounds merely had mange, and the story of weight dropping to break their backs was a fabrication. When the woman was detected in perjury she escaped further exposure by fainting. Why will the public accept the word of these diseased minds? The judge charged the jury as follows:

"To indicate a view on the part of these physicians that these operations upon dogs were made for scientific purposes to obtain information for the alleviation of human suffering, I charge you that the law of Pennsylvania does not allow pain and suffering, torment or torture to be inflicted upon dogs for any purpose except for the relief of the suffering of the dog itself. \* \* \* The law says that any person who is guilty of wanton and cruel torture of an animal shall be guilty of a crime. The law does not say they shall not be guilty if they do it for a scientific purpose. Scientific purpose does not exclude cruelty."

If that is the law in Pennsylvania, then with Mr. Bumble we must say, "The law's a Hass," for no farmer can legally castrate a calf or colt. We are afraid that something is wrong with the interpreter of the law, not the law itself. The attorney for the persecutors was not fighting vivisection but imaginary cruelty after it. He now says that he will prosecute the doctors for vivisection, but he will not move against the farmers who never give an anaesthetic. Perhaps there are enough intelligent Pennsylvanians to suppress these enemies of society who are misusing the law, and incidentally elect another judge when this one has served his time—a judge who will not hamper the saving of human life by decisions in favor of dogs.

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#### ANTIVIVISECTIONIST MERCY.

The counterpane that covers motherhood  
Too often still become a shroud entwined:  
"Let not this sacred act demand our blood  
But spare the dog and all his sacred kind."

Our little children fall a hideous prey  
To childhood's scourge, and broken, bent,  
they lie:  
"Blot out this epidemic from the day,  
But spare the monkey and the stable fly."

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The White Plague stalks abroad with poisoned breath  
And leaves men prostrate like a broken twig:  
"Oh! spare us from this poignant, living death,  
But do not touch the precious guineapig."

From overseas the pest comes like a ghost,  
And settles grinning on our household mats:  
"Oh! save us from this devastating host.  
But spare the poor mosquitoes and the rats."

A growth malign, with tentacles a score,  
The fairest and most useful friends will claim:  
"Oh! let us suffer from this scourge no more,  
But spare the mouse, we ask, in Mercy's name."

—Samuel M. Brickner, M. D.,  
in *New York Times*.

**The promiscuous sale and use of bichloride of mercury tablets** have only been partly controlled by recent legislation and it is apparent to those who have carefully studied the question that something further is needed if the dangers are to be entirely removed. Many and various are the schemes that have been brought forward to solve the problem, but one of the most ingenious thus far presented is the plan offered by Fitch (*Pediatrics*, June, 1914.)

As a result of his investigations and research, he proposes the following federal and state legislation to regulate the sale of bichloride of mercury. 1st. Limit the sale of the poison in its present form, only to physicians for their personal use and to hospitals for institutional purposes; 2nd, when sold to the laity bichloride of mercury shall be put up in a tablet form of 7 3-10 grains of bichloride of mercury, ammonium chloride 7 7-10 grains and 1 1/4 grains of antimonii et potassii tartras—tartar emetic so compounded that the tartar emetic will promptly exert its full emetic action on reaching the stomach before the corrosive sublimate can begin to exert its violent, irritant and deeply caustic action. This it is claimed will in no wise hinder the bactericidal, germicidal, disinfectant or antiseptic action of the bichloride of mercury, but on the other hand the tartar emetic will have a synergistic action.

The physiological action of tartar emetic produces prolonged nausea, violent and repeated vomiting and retching, completely

evacuating the stomach contents. So no matter whether such a tablet is taken accidentally or with suicidal intent the result will be the same in all cases, prompt and complete evacuation of the stomach contents, with the result of saving human life.

While further experiments and actual experience with human beings will be necessary to demonstrate the practical utility of this proposition to coat bichloride tablets with tartar emetic, it certainly deserves earnest consideration. If it is found feasible it will certainly prove an easy solution of a serious problem.

**The veto of the bill permitting a plea or verdict of "guilty but insane"** has been a great shock to all those who have been so long working for a reform of our atrociously bad legal machinery. The medical and legal professions seemed to be overwhelmingly in favor of this proposal, but the Governor was afraid that many criminals would escape punishment this way. Such fears indicate that the Governor believes that a criminal would prefer many years or a life time in an asylum to a few in jail. Legislatures are in such a habit of passing ill-considered and freak bills inimical to public health and public welfare, but designed to confer special privileges on limited classes, that governors get into a habit of vetoing everything in which there is any doubt as to the wisdom of the measure. They make mistakes as did Governor Fielder, in vetoing the bill for the establishment of the branch of the Rockefeller Institute, but on the whole they seem to have used the veto to the public good. We do not want experimental laws, and as a lesser evil we must accept the errors as temporary setbacks, and should not be discouraged. No doubt, a new bill next year can be framed to dissolve his fears as to the danger of criminals escaping justice. Besides all this, malingering of insanity is the most difficult thing to do, and the easiest thing to detect. None will escape by a false plea. The confession of guilt can be used against the accused when his malingering is proved, and the administration of justice facilitated.



## THE ESTABLISHMENT OF LACTATION.

BY

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If one tithe of the human ingenuity which of recent years has been lavished on the artificial method had been bestowed on studying improvements in feeding of infants, I believe that comparatively few of the breast babies would even now in these so-called degenerate days, be relegated to the bottle.

It is most gratifying to me personally, in view of the efforts I have made to extend the educational influences of infant consultations, to realize that many of the improvements in the natural method of feeding infants which have been introduced of late years, have been directly due to the energies of those who are engaged in this particular branch of preventive medicine.

In this connection I would more particularly refer to the work of Dr. Ronald Carter<sup>1</sup> in Kensington, of Dr. Jessie G. Duncan<sup>2</sup> in Birmingham, of Dr. Ella Webb<sup>3</sup> in Dublin, and of Drs. A. E. Naish and Lucy Naish<sup>4</sup> in Sheffield.

Unfortunately at our infant consultations we gain more experience in the general

management of breast feeding at a later stage than we acquire of that most important phase known as the establishment of lactation, for we are seldom called upon to advise on the care of infants under three weeks' of age.

So important do I consider the management of the early stages of lactation to be that I propose to devote a whole lecture to this subject and to leave the particulars of the general management of breast feeding to another occasion.

The obstetric physician who has unrivalled opportunities for studying the early phases of mammary activity, is, as a rule, too closely concerned with the interests of the mother to pay much regard to those of the infant, or to the practical details connected with the establishment of the milk flow. On the other hand the children's specialist is seldom consulted until breast feeding has already proved a failure, or until the infant has been weaned and relegated to the bottle. The consequence is that the study of this important stage of breast feeding falls between two stools, between the apathy of the obstetrician and the want of opportunity on the part of the children's specialist.

One of the great difficulties with which those who are interested in the problems of infant mortality have to contend, is the early and unnecessary weaning of quite young infants. Dr. Ella Webb<sup>3</sup> to whose work in Dublin I have already referred,

has published an analysis of the causes of premature weaning of 200 infants who were brought to her infant consultations. The following is a resumé of her results:

(1) Insufficient milk .....	93 cases.
(2) Illness of the mother.....	35 "
(3) Disagreement of milk with infant .....	22 "
(4) Sore breasts .....	16 "
(5) Mother going out to work.....	13 "
(6) Advised by nurse or friend to wean .....	8 "
(7) Child refusing breast .....	5 "
(8) Death of mother .....	6 "
(9) Hare lip .....	1 "
(10) Accidental illness of child causing great fatigue to the mother through watchful nights .....	1 "
 Total.....	200 "

I find that my own experience closely coincides with that of Dr. Webb, except for the fact that I meet with fewer instances in which illness in the mother has been alleged as a cause, and more cases in which the milk is said to have disagreed with the infant. I should also have to include a larger number of cases in group (6).

Unfortunately Dr. Webb does not tell us at what dates these infants were taken off the breast. Speaking from my own experience, I find that of all cases of early weaning no less than 33 per cent. are deprived of the breast during the puerperium; a proportion which in my opinion can be justified by no possible combination of circumstances.

A very large number of infants are weaned during the first three weeks of life owing to the advise of doctors, nurses and friends on very slender evidence that the breast itself is at fault. Troubles there often are connected with the establishment of the motor and digestive functions of the stomach and bowel in infants, which may make it appear that the milk is responsible, but exactly the same troubles, only in an ag-

gravated form, may ensue when resort is made to artificial feeding.

It is quite impossible to determine at first whether a young mother—and more particularly a primipara—will eventually prove a good nurse or not. I have known many most unpromising cases turn out complete successes after a few weeks of patient effort.

During the puerperal period we must be prepared for accidents and *contretemps* in connection with the establishment of lactation, but, because our first efforts are not successful, we are not justified in relinquishing all further attempts to keep the infant at the breast.

The nervous and glandular mechanisms concerned in the secretion of milk are extremely complicated, and most of the difficulties which arise in connection with breast feeding are concerned with setting the machinery as a whole in motion. I believe that it is never justifiable to wean an infant during the first three weeks of life, simply on the ground that the breast remains dry. I have known many instances in which the breasts have remained refractory for three weeks or longer, and then have afforded satisfactory supplies of milk. The following experience illustrates this point.

A primipara was confined at full time in a maternity institution. The infant was perfectly healthy and was put regularly to the breast for the first three days. On the fourth day as no milk appeared in the breast the baby was given cow's milk in a bottle, and was permanently weaned on the 7th day. Contrary to instruction, however, the mother secretly put the infant to the breast at night in the hope that the milk might come at a later date and that the inconveniences of a second pregnancy might

thereby be averted. On the 14th day the mother left the institution and returned home still feeding the infant during the day on the bottle, and giving it the breast at night.

When the infant was 10 weeks old the mother brought it to my "infant consultations" and gave me the details as already described.

On examining the baby I found it much under weight and in a very poor condition of nutrition. On further enquiry I elicited the fact, that although the mother put the infant to the breast at night with the object already stated, she was under no delusions that the infant derived any benefit from the proceeding or that her breast contained any milk. Feeling convinced, however, that the infant would not acquiesce in the conspiracy unless it received some reward for its efforts I examined the mother's breasts and found, as I expected, that both contained a small quantity of milk. So I straightway ordered a "test-feed" to be given, and much to the mother's surprise demonstrated the fact that the baby extracted  $3\frac{1}{2}$  ozs. of milk. In consequence of this discovery I ordered the infant back to the breast and with the exercise of a little care and encouragement succeeded in postponing artificial feeding until the end of the 7th month.

I have little doubt that a large proportion of the cases which are relegated at an early date to the bottle, might be saved from the dangers incidental to this proceeding by the exercise of the same degree of patience as that which was displayed in a less worthy cause by this poor woman.

The following are the particulars of another case which illustrates the value of patience in bringing about a satisfactory

secretion of milk under most unpromising circumstances.

A woman was confined of her first baby on Jan. 4th, 1907, at a maternity hospital.

The infant weighed 7 lbs. 10 ozs. and was quite healthy at birth. During the 12 days the mother stayed at the hospital the infant was put regularly to the breast, and nothing was noticed amiss with him except that there was obstinate constipation. On Jan. 17th the baby was brought to my "*infant consultations*" chiefly because of this symptom and also because he was losing weight.

On being placed on the scales he was found to have lost 10 ozs. since birth.

Owing to the loss of weight, constipation and oliguria, I thought it was extremely likely that the infant was suffering from inanition. So I ordered a "test-feed" and found that the quantity of milk which the infant extracted from the breast was only a few teaspoonfuls. I therefore ordered a small quantity (6 ozs. in the 24 hours) of whey and cream to be given to the infant in addition to the breast, hoping that by keeping the infant hungry and allowing him also to apply stimulus to the breast the latter would ultimately become functionally active. During the following week the infant showed unmistakable signs of improvement in his general condition, but repeated "test-feeds" proved that this result was not due to any increase in the quantity of the breast milk.

During this week the child recovered 6 ozs. of the weight he had previously lost. On Jan. 28th the infant was again weighed and found to have gained 8 ozs. in weight, although the test-feeds still proved that the breasts were nearly dry. By Feb. 4th there was a further gain in weight and every indication that the glands were beginning to secrete normally. By Feb. 6th the mother

felt the draught when the child was put to the breast and from that time forward it was possible to remit the artificial feedings, and the infant made uninterrupted progress on the breast. The points of interest in this case are, firstly, that it was practically one month before lactation was fully established, and that during the last fortnight the infant was kept in a good condition of nutrition by very small quantities of artificial food (6 ozs. of whey and cream in the 24 hours). The second point of interest is that the cause of inanition from which the infant was suffering was not detected in the maternity institute in which the infant was born, although the baby presented all the classical symptoms of starvation, i. e., constipation, loss of weight and oliguria.

Although I shall again refer to these points in greater detail, I would at the outset emphasize the fact that the establishment of lactation is dependent on the fulfillment of the following conditions, firstly the nipple must be stimulated by the sucking of the infant, secondly the nerve centres which control the functions of secretion and the vascular supply must be in a condition of adequate excitability, and thirdly the blood itself must contain a sufficiency of the raw material out of which the mammary secretion can be elaborated.

On purely hypothetical grounds we should naturally assume that the stimulus afforded by the sucking of the infant itself would be more effective in bringing about the reflex activity of the glands than any other form of excitation; it is, however, satisfactory to know that this theoretical assumption has been substantiated by the practical observation of Dr. Jessie G. Duncan.<sup>2</sup> In a series of experiments carried out in Birmingham, Dr. Duncan was able

to prove that the amount of milk which the pump was capable of extracting from the breast was in all cases considerably less than that which was obtained by the natural efforts of the infant.

Further we have ample evidence from the experiences of the late Pierre Budin<sup>5</sup> that the total quantity of milk secreted by a nursing woman is directly proportional to the intensity of the stimulus applied. A weakling baby, with feeble powers of sucking, extracts only a small quantity of milk, whereas a strong lusty baby secures, as a rule, a good meal. In his book "The Nursling" he supplies the protocols of the actual amount of milk supplied by a number of wet nurses employed in his clinics. Some of the women acted as foster mothers to two, three, four or more infants and the tables show that the greater the demand the greater was the supply: in certain cases of multiple feeding, the total amount of milk supplied to the infants in 24 hours was surprisingly large.

The intensity of the stimulus afforded by the infant will naturally depend on a variety of conditions: for instance on the strength of the infant, and its degree of hunger, also on the shape of the nipple and the sensibility of its tactile nerve endings.

An appreciation of these facts will necessarily suggest a number of practical expedients to promote the activity of the secretory apparatus. For instance in anticipation of possible difficulties in nursing, the nipples should be drawn out and prepared for their duties for some considerable time before the time of the expected confinement, this is particularly desirable in the case of the primipara. The best method<sup>3</sup> of drawing out the nipple is to invert over it the bowl of a long stemmed clay pipe (church warden) and then to

induce a vacuum by means of suction applied to the mouthpiece. The patient can easily carry out this devise for herself, and she should be instructed to commence doing so for some weeks before the confinement. The rim of the bowl should be well greased with vaseline in order that it may adhere to the surface of the skin and enable a good vacuum to be produced. The usual plan of hardening and preparing the nipples by treating them with astringents is not to be recommended, for such applications not only dull the sensibility of the tactile sense, but they also tend at a later date to indurate the tissues and to produce cracks and fissures of the epidermis, especially if the infant is rough in its method of seizing the nipple. The indications are not so much to render the superficial epithelium hard and cornified, as to make it thoroughly supple and elastic and to accustom it to the sort of treatment to which it will be exposed when the infant is put to the breast. The best means of preparing the surface of the nipple is to massage it daily with lanoline or some other emollient preparation. It is further desirable to remove all crusts from the surface of the nipples, for such crusts not only tend to form if there is any oozing of secretion towards the end of pregnancy, but to leave the underlying epithelium tender and liable to maceration when the caked secretion is subsequently removed by the lips of the infant. All these are small matters, but from the point of view of successful nursing, they are not without their importance. It is, of course, needless to say that at the end of each feeding the nipples should be most carefully cleaned with boracic lotion applied with cotton wool and subsequently thoroughly dried with lint or some other soft material.

In order that the infant may apply ade-

quate stimulation to the nipple, it is of all things most necessary that it should itself be actuated by the most potent of all incentives, namely, hunger and thirst. For this reason the humane instincts of doctor or nurse to relieve the supposed wants of the infant by potations of water or other fluids should be sternly resisted. It not infrequently happens, however, that despite our best endeavors, the infant will not apply the desired stimulus to the breast.

Under such conditions we must be prepared to resort to other expedients and coax the infant to play its part in the establishment of the mammary functions. Sometimes the smearing of the nipples with a little glycerine, honey or even condensed milk may tempt it to apply its lips, at other times a temporary exchange of babies may effect the desired object. Unfortunately it is not always possible to find a baby of the required type to perform the function of an artificial pump, and considerations of possible infection with syphilis may damp our ardor, for no one would willingly accept such responsibilities, unless the need were commensurate with the risks. In maternity wards, however, there is usually one infant at least which can safely be employed for this purpose, and by employing a baby in this way a double purpose is served, the dry breasts of the woman who cannot nurse are stimulated into activity, and the weakly baby can be nourished into life by being placed at the active breast of the other mother.

Dr. H. C. Cameron<sup>6</sup> describes an interesting case in which such a substitution was effected with the most happy results. The accompanying chart represents the weight curve of a premature infant born in Guy's Hospital and fed by an accommodating foster mother in the manner described.

On the eighth day of life the weight of this premature baby had fallen 14 oz. and it was obvious that it would soon die if not provided with some better form of nourishment than that supplied by the mother. The woman in the next bed happened to have a vigorous baby 14 days old and weighing 8 lbs. and as she consented for the time being to play the part of foster mother to the premature infant, an exchange of babies was immediately effected. Eight days later the premature baby was returned to its own

of an older child recently weaned may be conveniently enlisted for the purpose. He says "More than once among the poor outpatients I have induced the mother to put back to the breast a child which has been recently weaned."

Opportunities to employ this ingenious expedient must be comparatively rare for women seldom nurse their infants during pregnancy, and therefore can rarely have a recently weaned child at hand when the next one is born.

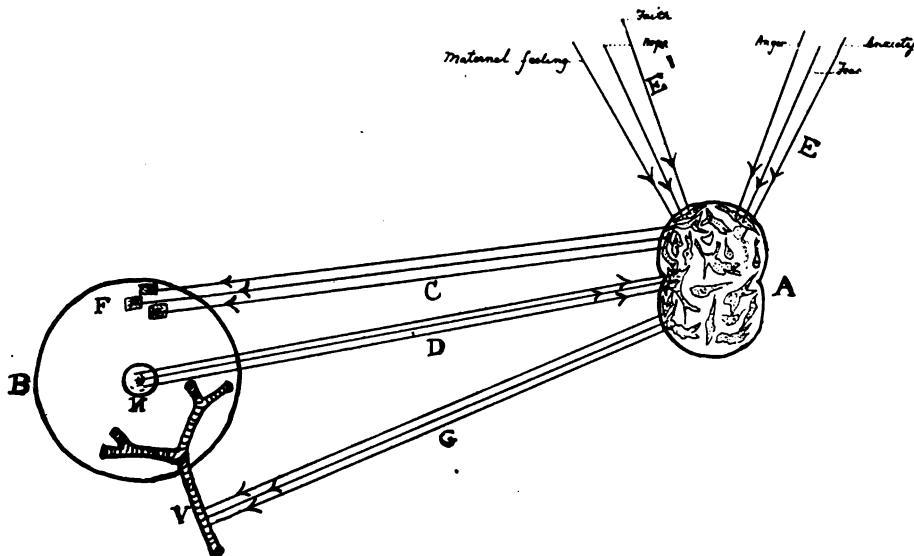


Diagram to show nervous mechanism concerned in mammary secretion.

mother, whose breasts by this time had been stimulated into functional activity by the impudent addresses of the borrowed infant. A glance at the chart will indicate the success of the experiment as far as the weakling infant was concerned: to complete the picture we ought also to have been provided with the weight chart of the other infant.

Dr. Cameron suggests further that when a baby of this kind is not procurable to perform the required duties, the services

The physiological activity of the mammary glands is dependent on a very complicated nervous mechanism, in which mental and psychological factors are closely concerned in addition to the direct centripetal influences. It would be difficult to define accurately the origins or paths of these mental impressions which reinforce the effect of the more direct reflex stimulus. We know, however, that emotions and emotional states can sensitize or activate local nerve centres so that otherwise normal, or

even subnormal stimuli reaching them through the direct reflex route, can cause normal or exaggerated results.

There is a very close relationship between the specific secretory functions of a gland and the vascular supply. The two sets of centres, in fact, act as if they were in anatomical continuity. The influence of the emotions on the vaso-motor functions explains the dominant influence of psychological impressions on the secretory functions of the mammary glands.

That curious complex of emotions known as the maternal instinct has an undoubtedly favorable influence on the secretion of milk, just as fear, anxiety, hatred and anger have a reverse effect.

Most women who have nursed infants successfully are familiar with the phenomenon known as "the draught," a feeling of fullness that takes place in the breasts when the infant begins to suck.

This phenomenon has probably little to do with the sudden resolution of the substance of the gland cells into milk as is generally supposed; it rather represents a sudden engorgement of the blood vessels of the breast in consequence of a vasodilator crisis.

This vaso-motor phenomenon can manifest itself with the same rhythmical and automatic periodicity that is familiar in the case of certain other organic functions, for it is one of the properties of nerve centres, such as those which subserve the mammary activities, to acquire rhythmical habits when the stimuli which first evoke the functions follow one another in regular and orderly sequence. If therefore the infant is given the breast at absolutely regular intervals during the first few days of life, there is a reasonable probability that the receptive and impressionable nerve centres which control the functions of mammary secre-

tion will acquire a rhythm and automatism which can be made to subserve most useful purposes and promote the chances of successful breast feeding.

The usual practice in maternity institutions is to feed the infant three times during the first 24 hours, 4 times during the second or third day and finally when the functions of lactation have become permanently established, to give the baby the breast every two hours.

For the reason already stated I do not regard this plan as well designed to promote breast feeding and the establishment of a rhythmical automatism. The frequent changes in the intervals of feeding must necessarily interfere with the assumption by the nerve cells of periodic habits at the very moment when such habits are most easily induced.

If advantage is taken of this opportunity to impress the habit of regular activity on the nerve centres, the breasts may be induced to assume such a regular periodicity, that the times of feeding, as they come round, can be recognized by the in-coming of the draught.

Mrs. Lucy Naish<sup>4</sup> whose opinion on all matters connected with breast feeding deserves the fullest attention, advises against the practice of putting the infant to the breast more than 3 times during the first few days after the confinement, on the grounds that nursing exhausts the mother, and that the nipples are liable to become sore and excoriated if they are exposed too frequently to the friction of the infant's lips. I cannot agree with these objections because I consider that the physiological and the psychological influences of suckling altogether outweigh any possible disadvantage on the ground that nursing causes fatigue to the mother, and because I believe

that, if the nipples have been properly prepared before the confinement, there need be no soreness due to sucking.

Provided that both breasts are in a state of functional activity, "the draught" occurs on both sides simultaneously. Of this associated action advantage may be taken in several ways, for instance it is sometimes of vital importance to obtain breast milk for infants who are unable to extract it from the breast for themselves. In such cases the breast pump is usually employed, but, as I have already mentioned, the quantity that can be obtained by this means is invariably less than that which is extracted by the infant, but if a strong infant is put to one breast and the pump is applied to the other, the physiological stimulus afforded by the infant promotes the draught and a more abundant flow into the receiver of the pump and this milk whether from the infant's own mother or from some other nursing woman may be instrumental to save life. Indeed it has been claimed that this method may be employed as a modified form of "test-feed," that is to say the amount of milk extracted by the pump from one breast may be an accurate gauge of the quantity obtained by the infant from the other.

During the summer of 1913 two twins were brought to my consultations, one of them was strong and lusty, the other small and feeble. We gave each of them a test feed, one being put to the left breast and, subsequently, the other to the right. The amount the strong baby secured was apparently adequate for his requirements, whereas the weakling obtained an insufficient quantity. Believing that the weakling was suffering from inanition due to his feeble attempts at sucking, I instructed the mother to feed both of the twins simultaneously, holding one to the right breast and the other to the left. I also instructed

her to be prepared to feed them in this way on the next occasion she attended at the dispensary. On the following week we found that the smaller of the twins had improved considerably in condition, and that he had put on more weight than his brother. The mother further told me that since she had adopted this double method of feeding "the milk seemed to pour into small baby's mouth without his doing any work at all." The evidence of the test-feed confirmed her statements.

Reverting once again to the question of the times of feeding and the acquisition of rhythmical habits I would insist on the great advantage conferred on the mother as well as on the child by the adoption of the three hourly method of feeding. In Germany there is a tendency to make the intervals even longer than this and to allow four hours of rest between two consecutive feedings. On the whole I do not think this plan answers very well in the case of English nursing mothers, and even in Germany with extended experience, it seems that the infants obtain more milk and put on more weight when they are fed 6-8 times than when they are fed 5 times during the 24 hours.

Professor Hans Reitchel<sup>7</sup> who has paid a considerable amount of attention to this question comes to the conclusion that we cannot lay down hard and fast rules, each case must be treated on its own merits, and the number of feedings must be determined by the prevailing conditions; in the case of first children his enquiries indicate that four hourly feeding is seldom a success, at least for the first few weeks of life.

Whatever arguments may be urged against limitation to five feeds in the 24 hours, little can be said in favor of the two hour system, for in so short an interval the

stomach cannot be completely emptied except in quite rare instances, and it is essential that this important digestive organ should have time to recover after one period of activity before it enters upon another. It is unfortunate that the 2 hourly method of feeding has been sanctioned by immemorial custom, and that it has so many attractions for the impatient mother.

Notwithstanding the arguments I have already cited in favor of the firm establishment of rhythm in the times of feeding, I see the advantages of longer intervals at night in order that a prolonged period of sleep may be secured. The value both to the mother and to the child of one long uninterrupted spell of sleep cannot be exaggerated, and the earlier this habit is induced the better it is for both. Habits of sleep are very easily acquired, especially when advantage is taken of the quiet and darkness of the night. On the other hand when once the infant has formed a habit of waking up in the night to be fed, it is very difficult to induce it to dispense with its accustomed feed. It is not so difficult as is supposed to train any infant to sleep right through the night say from 9 p. m. to 6 a. m. if the room is kept quite dark and quiet, but it is very difficult to persuade any mother that it can be good for an infant to be kept without food for so long a time. Provided, however, that an infant obtains a sufficient amount of food in the 24 hours to satisfy its physiological requirements, it is a very distinct gain that there should be one long interval of rest such as this. As a council of perfection I believe that the best hours for feeding an infant are 6, 9, 12, 3, 6, 9—that is to say, six feedings during the day and an interval of 9 hours during the night. Although an infant will require to "be changed" or held out

during this long night interval, the function of micturition can be made so automatic that it soon becomes a reflex which can be made to take place during the sleep if the child is given the required opportunity.

The establishment of a broken rhythm of this kind is not so irrational as might be imagined. All of us acquire irregular periodicities of this kind at some time or other, but infants acquire them more easily than older individuals.

It is quite a mistake to suppose that young infants, that is to say, infants under one month of age, normally derive much nutritive material from their mother's breasts. During the colostrum period which usually lasts 3 or 4 days the amount of secretion is quite insignificant, and even after the establishment of lactation the quantity of milk obtained is far less than is usually supposed. Judging by the statements which appear in text-books on the subject of infant-feeding, one would imagine that by the end of the first week of life, the infants usually extract about a pint of milk from the breasts.

The evidence on which this belief is based is that which has been afforded by a comparatively small number of "test-feeds" conducted in maternity institutions in Germany. For instance, Camerer's figures, which constitute the usually accepted standard are derived from six cases only, and Freer's estimates are based on a similar number. Repeating these experiments at my suggestion, on a much larger scale, namely, in the case of 61 infants, Dr. W. O. Pitt<sup>1</sup> was able to show that the average amount of milk secured by London mothers confined in a maternity institute was very much lower than the German standards. Dr. Pitt's results are here appended:

Day.	TABLE I.		Average quantity of milk taken in 24 hrs.	number of feeds each day.	Average quantity of each feed.	Average daily weight.
	oz.	drs.				
1st	0	9	3.23	2.28	7	1
2nd	1	15	5.00	5.23	7	1
3rd	4	12	8.88	8.19	6	10
4th	6	4	9.24	9.98	6	15
5th	6	11	9.33	11.70	6	15
6th	7	3	9.22	12.39	7	1
7th	7	9	9.53	12.43	6	15
8th	7	13	9.44	13.29	7	3
9th	8	1	9.43	13.80	7	2
10th	8	4	9.11	13.93	7	2
11th	7	14	9.40	13.36	7	0
12th	8	8	9.38	14.88	7	4
13th	8	13	9.23	14.69	7	4
14th	8	11	9.48	14.70	7	9
15th	9	3	9.29	15.70	7	3
16th	9	8	9.52	15.95	7	7
17th	9	4	9.54	15.94	7	6
18th	9	10	9.58	16.08	7	4
19th	9	12	9.69	16.07	7	3
20th	10	4	9.00	18.43	7	4
21st	11	5	8.00	18.10	7	9
22nd	10	6	9.28	18.4	8	1
23rd	11	7	10.00	18.3	7	8
24th	12	2	10.00	19.4	7	6

Table to show the average amount of breast milk secured by infants in 24 hours and at each feeding. This table also shows (column 4) the average weight of the infants (61) and the number of feeds (column 2) in the 24 hours. It is to be noted that in columns 1, 3 and 4 the figures refer to avoirdupois and not apothecary's weights.

In Table II Dr. Pitt's results are placed side by side with those of Camerer and Freer.

TABLE II.—*Average Number of Ounces of Milk Consumed by Nurslings in 24 Hours during the First Ten Days of Life.*

Day of life:	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
Our cases										
(61)	½	1½	4½	6½	6	7½	8	7	8	8½
Freer's cases	(6)	0	½	5¾	11¼	15	16½	20	18½	21
Camerer's cases	(6)	¾	2½	6	11½	12½	13	16	16½	16
										15¾

It will be noticed that Camerer estimates that the amount of milk obtained by infants on the 7th day of life is on an average 16 ozs. and Freer 20 ozs., whereas Dr. Pitt's

figures for the corresponding day amount to only 8 ozs.

I call attention to these figures because doctors and nurses are very apt to suppose that infants are being starved if during the early days of life, they do not obtain amounts of food which conform to the usually accepted standards. Such a belief is quite unjustified; the infants in Dr. Pitt's (see column 4 of Table II) series of cases showed quite normal progress and average increments in weight in spite of the small quantity of milk they obtained. Any unwarrantable interference with Nature's supply by supplementary feeding during the early days of life until lactation is fully established, is extremely likely to interfere with the ultimate success of nursing.

If the foregoing explanations of the factors on which successful breast feeding depends are understood, it is perhaps unnecessary to point out how irrational and unscientific are the usual expedients adopted to secure the establishment of lactation and promote the subsequent flow.

A short time ago I asked a class of experienced midwives what was the most important factor to attend to in the establishment of lactation. They one and all replied that the feeding of the mother was the most important consideration, and I could coax no other suggestion from any member of the class.

If what I have already said on this subject is physiologically and substantially correct, it is quite clear that gruel, or Benger's Food, or nursing stout can have no influence in the matter. The conditions on which the establishment of lactation depend are, normal stimulation of the nipples, normal conduction of the nerve impulse, and normal reflexion of the impulse by the nerve cells in the centres concerned.

That is to say it is the normal behavior of a normal reflex arc that controls the vascular supply and the secretory functions. You cannot force these glands to activity by saturating the blood with nutritive material.

It is of course essential that the blood should contain the raw elements required for the manufacture of milk, and that if a large quantity of the manufactured article is required, a large quantity of raw material must be supplied. But for the mere establishment of the function of lactation it is not only unnecessary, but even harmful to attempt to overfeed the patient. The blood always contains a sufficiency of the raw material.

Of recent years a good deal has been written and said on the subject of galactagogues and several preparations have been largely advertised as being capable of influencing the supply. As far as I am aware no specific galactagogue has yet been discovered, neither linseed oil, nor cotton seed oil nor any of their derivations can be regarded as galactagogues in the proper acceptance of the term. They are foods just as cod-liver oil or olive oil are foods, and they can serve as the raw material out of which certain of the constituents of milk can be manufactured, but they cannot influence the establishment or the non-establishment of lactation, although many poor people are induced to purchase these preparations and to take them under the belief that the money is well expended, and that they have some specific charm in the secretory powers of the mammary glands.

I hope I may be forgiven if once again I recapitulate the important requirements in the establishment of lactation, and in the hope that my explanations may be the better understood, I append a schematic diagram to

illustrate the nervous connections of the glands.

This diagram shows at A a schematic representation of the vasomotor and secretory centres which act in close functional correlation.

These centres are also intimately connected with the higher brain centres and their excitability can be reinforced or lowered by emotional and psychic influences; the paths along which these currents flow are indicated by the letters E and E<sup>1</sup>. It is possible that these centres are also activated or sensitized by internal secretions connected with uterine and ovarian functions which circulate in the blood and reach them through vascular channels.

The liberating stimulus for the discharge of the centrifugal impulses is received by the centres along the sensory nerves D which are in connection with the nerve endings in the nipple N.

The efferent impulses travel (1) along the somatic nerves C (intercostals and supra-clavicular) to the secretory cells F and (2) along sympathetic fibres G to the blood vessels of the glands.

An examination of the factors on which the establishment of lactation depends emphasizes the importance of the following points.

To set the secretory mechanism in motion it is necessary that the liberating stimulus received from the nipple should be adequate in intensity to evoke the required response from the controlling nerve centres A. The responsiveness of these centres can be materially promoted by the favorable co-operation of the higher centres which subserve psychic and emotional activities, they are, in fact, activated and reinforced by the concentrated fire of nerve energy which can be directed upon them by the

psychic batteries of the higher brain. There is reason to believe that internal secretions or hormones circulating in the blood can also activate or reinforce the activities of these centres, there are however, no grounds for believing that foods or so-called galactogogues can have any influence in setting in action the nervous mechanism of secretion.

NOTE—The subject of *The Early Management of Breast Feeding* will be taken up in the June issue. The references for both articles will also appear in the next number.

## ORAL SEPSIS AND THE PRINCIPLES, PRACTICE AND APPLICATION OF VACCINE THERAPY TO DENTAL PRACTICE.<sup>1</sup>

BY

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It is curious to note how all branches of biology, whether they deal with humans or not, are more and more becoming correlated; indeed, we are finding in the allied sciences of physics and chemistry, aids to diagnosis and treatment which would have been but "dream-shadows" less than a generation ago. So rapidly has the knowledge of the professions of medicine and of dentistry advanced that the wonders of yesterday are but the half-interesting, half-remembered things of today; and it is well that it is so. Still waters soon die.

And are we not closely allied?—an alliance, indeed, which I fear too few in either profession sufficiently realize. But more and more is the evidence accumulating to indicate how important it is for the physician to consider the mouth and what it con-

tains, in so far as certain general disorders are concerned, and similarly for the dental surgeon to realize the great part he can play in controlling these disorders; nor should I forget the immunologist, who is the handmaiden of both.

Another curious fact attests to the bizarre workings of the human mind. Physicians have long recognized that the nose and upper respiratory tract with its sinuses are important causes of general disorders, and yet it is only comparatively recently that we have turned our attention to the mouth. Perhaps because it is so obvious.

One of the first to point out the importance of "Oral Sepsis" was William Hunter,<sup>3</sup> and I should like to record my appreciation of his work. What is "oral or mouth sepsis?" Briefly, it is any infection in any tissue in front of the anterior pillars of the fauces. The possible sites of infection are numerous, but I will not detain you with such disease processes as affect the tongue, hard palate, cheeks, etc., but rather direct your attention to those diseases of the teeth and adjacent structures which influence the general health of the individual.

Dental caries would undoubtedly be the most serious of all such diseased conditions if our science were unable to control it effectually. But there is one common disease which tries our patience and our ingenuity to the uttermost. I need hardly say that I refer to the disease commonly known as "pyorrhea alveolaris." Is it exaggerating to say that 15 per cent. of all cases over the age of thirty years who consult us are afflicted with this disease to a greater or less extent? At any rate it is exceedingly common, and to my mind there are few chronic disorders so far reaching in their ill effects upon the human organism. And

<sup>1</sup>Read before the Toronto Dental Society.

yet how slow both our professions have been to recognize this, that is so obvious, when once we stop to consider it! Here we find one or many pockets between gums and teeth crammed with secretion, laden with millions of microorganisms and their toxic products, and, finally in addition, the tissues of the gums infected.

These, as you know, are in direct communication with the lymph stream that can and does convey the organisms or toxins to the lymph nodes in the neck, and thence, perchance, eventually to the blood stream. This is one way in which these infective processes reach the human organism. Another way is by the alimentary canal, and still another by way of the nose or antrum of Highmore or the Eustachian tubes or the respiratory tract, as nothing is more certain in an infective process than its propagation by continuity or contiguity of susceptible tissues.

Now the effects of pyorrhea alveolaris may be (a) local, (b) adjacent, (c) distant and local, (d) systemic.

I need not discuss the local changes in detail. Adjacent pathological changes are found in (1) Inflammation of the submaxillary and cervical lymphatic glands. (2) Suppuration in the antrum of Highmore. (3) Nasal and nasopharyngeal infection. (4) Infection of the middle ear by way of the eustachian tube. (5) The hair follicles of the lips causing sycosis barbae.

The distant and local pathological changes are to be found (1) In the gastrointestinal tract—causing the symptoms associated with so-called "indigestion" and also at times diarrhea. (2) In such respiratory disorders as bronchitis, etc. (3) In certain forms of chronic arthritis. (4) In certain cases of so-called neuralgia or neuritis, sciatica, etc. (5) Possibly in psoriasis, certain eczemas, and urticaria.

The systemic effects are due to absorption either directly by way of the lymphatic stream from the gums or indirectly through the gastrointestinal tract. Mental and physical inaptitude are characteristic; neurasthenia, depression even to melancholia and limitation of physical effort. A moderate or severe secondary anemia is common, and indeed certain authorities believe that oral sepsis indirectly gives rise to certain specific hemolysins that affect the blood changes characteristic of pernicious anemia. This is going pretty far, you will say! But is it not? I think so; indeed I am confident that when the final audit comes not only this severe but many other disorders will be traced to pyorrhea alveolaris.

Then there are other affections of the teeth and gums which merit consideration. These are dental caries, chronic and acute gingivitis, ulcerative gingivitis and alveolar abscess. But we need not be detained longer than their mention necessitates.

What is the cause of pyorrhea alveolaris? So far as I have been able to discover no one knows. Bacteriological investigation readily demonstrates a veritable menagerie of microorganisms, not one or more of which has even been found guilty of causing this disorder. In direct smear of the pus of pyorrhea under the microscope, numerous different organisms are recognizable by their morphology or staining reactions, but it is curious that on cultivation of the flora one commonly finds only the streptococcus brevis (pneumococcus [medialia]); at times other organisms are associated, such as the staphylococcus aureus or albus or a streptobacillus, micrococcus catarrhalis, etc.

These bacteriological considerations would be only of academic interest were we not in a position to harness them to a

method of treatment that would seem to be of service. But before proceeding to a consideration of this method it would seem fitting to discuss certain fundamentals concerning bacterial invasion of the body in general, of immunity, and of methods of inducing immunity to microorganisms.

It is of interest to recall exactly what is a bacterium—it is “a microscopic spot of protoplasm contained in an envelope, able to reproduce rapidly by direct fission, dependent upon an adequate and appropriate food supply in a suitable temperature and also capable of secreting certain toxins or poisons.”

It is instructive further to note that only a small proportion is pathogenic to man. Indeed were it not for bacterial life this planet would be a veritable charnel house; millions of dead humans and other animal bodies would encumber the surface of the earth, for putrefaction would occur; and hence there would be no reduction of the complex organic or “vital” substances to the elements from which they had their origin.

It would, however, take us too far afield to follow this interesting question further, and therefore I shall proceed to deal with certain other matters.

How is it that certain pathogenic micro-organisms are unable to infect animal tissues while others are? For the simple reason that on the one hand the exposed tissues or body fluids possess an immunity or a power of resistance to the particular germ or germs, while on the other hand they lack this power. By immunity then is meant that an individual can control or ward off attacks of a microorganism, owing to some inherent power of the tissues or body fluids. Now we may be born with this power, and then we are said to possess

a *natural immunity*, or we may acquire it as the result of having had a certain disease, and this is called a *naturally acquired immunity*—such as occurs after an attack of smallpox, scarlet fever and so forth; or, again, we may possess an *artificially acquired immunity*—for example, after vaccination against smallpox and inoculation against typhoid fever or diphtheria. And it is this last variety of acquired immunity that possesses such vital interest for those of us interested in combating bacterial disorders, either in their prevention or their cure. No realm of medicine in recent years has seen such startling advances as this science of immunity, and yet how old the principles! Centuries before Christ we know that groping primitive minds hit upon certain practices of immunity that the brightest intellects of our generation have rediscovered and led into the fold of modern medicine. I refer to the shepherds of Upper Senegambia who practiced certain methods to prevent the spread of pleuropneumonia in their herds. They impregnated the point of a dagger with a little of the diseased lung tissue of an animal dead of this disease and then plunged it beneath the skin of healthy animals. By these means an artificially acquired immunity was induced.

Now this sort of immunity can be obtained in two ways. In particular, the first is commonly practised in the treatment of diphtheria; you are all familiar with diphtheria antitoxin and cognizant of its great service to humanity in controlling this serious disorder. How is the antitoxin produced? Simply by taking cultures of the diphtheria bacillus and by inoculating a horse over a considerable period with gradually increasing doses of the living germ. Eventually the animal's body fluids become

so laden with the antitoxin against the toxins produced by the bacillus of diphtheria that it can tolerate more than a lethal dose of living bacilli. When this point is reached the horse is bled, the blood allowed to clot and the serum extracted. This amber colored fluid is the antitoxin or serum against diphtheria. It serves the afflicted human by effectually neutralizing the toxins or poisons produced by the diphtheria bacillus, and which cause the manifestations of the disease as we know it. This discovery marked an epoch in therapeutics, and it was naturally supposed that a serum could be prepared for each and every organism that afflicts suffering humanity; but, unfortunately, in spite of the earnest endeavors of thousands of investigators, only a few sera have survived the test of experience—diphtheria antitoxin, antimeningo-coccus serum (for cerebrospinal meningitis) and possibly antistreptococcus and antitetanus serum.

I need not detain you with the scientific reasons for this failure, but will proceed to another method of inducing immunity which more intimately concerns us in our work. I refer to the use of bacteria or their products in the so-called bacterial vaccines. These act by calling forth an immunizing response in an individual who has been inoculated with an appropriate dose of a particular vaccine; or, in other words, these bacterial products induce the individual to manufacture antibodies which are specific for the dead germs inoculated. But I shall have occasion later to illustrate this method when I come to speak of vaccine therapy in pyorrhea alveolaris and other disorders.

Before proceeding to more practical considerations may I refer to a certain great principle concerned in "naturally acquired immunity?" Have you ever asked your-

self why an individual who contracts typhoid fever or any other infection does not die? It cannot be because of an inability of the typhoid bacillus to multiply sufficiently rapidly, for it is theoretically possible for one bacillus to multiply in 24 hours so that 280,000,000 are produced. There can be but one answer—namely, that resident within our tissues is a certain machinery of immunization which, when set in motion, turns out substances capable of combatting, and as a rule controlling, the vital activities of the typhoid bacillus. Let this be granted—then what is it that is capable of setting this delicate machinery in motion? Again there can be but one answer—the typhoid bacillus or its products, carried by way of the blood and lymph streams to the tissues whose work it is to produce antibodies. The great principle concerned in this phenomenon bears the name auto- or selfinoculation. Acute infections such as typhoid fever, pneumonia, scarlet fever, etc., usually kill or cure within a comparatively short time—kill if the patient refuses to respond to auto-inoculation sufficiently, and cure if he does so respond. On the other hand, chronic disorders such as boils, pyorrhea alveolaris, inflammation of the bladder, etc., frequently persist for long periods because the foci of infection are not close enough in contact with lymph or blood streams to allow of autoinoculation. Hence the individual's immunity to his infecting organism remains below normal, and organisms are carried to adjoining or other parts of the body and set up fresh manifestations of the disease. It is interesting to note that it is the chronic infections that *torture* humanity—the acute only *kill*; and I would submit that boils are productive of more real suffering in any modern community than typhoid, pneumo-

nia and erysipelas put together, and, too, that pyorrhea alveolaris, chiefly in its general manifestations, causes more trouble than all four together.

May I repeat that much more suffering in this world due to bacterial disease can be traced to microorganisms which torture body or mind or both and seldom kill, than to those which kill.

If autoinoculation could be induced or closely simulated, so would we employ the method of nature's method to control acute infections. Fortunately we can imitate nature's methods. It has been found that devitalization of microorganisms by moderate heat or mild antiseptics does not so alter their chemical constitution that they are incapable of calling forth a response similar to that of living organisms. But where is the proof of this extraordinary conception?

The proof is twofold. In the first place, *laboratory*, and in the second, *clinical*. When the Romance of Medicine comes to be written, a hundred years hence, no chapter will be more wonderful than that which tells of the discovery and measurement of those antibodies within the body fluids, their relationship to immunity and to the course of bacterial disease. Here, then, we find one proof that dead bacteria are capable of setting in motion that machinery which produces such antibacterial bodies as agglutinins, opsonins, etc. For example, if we inoculate a human being with, say 500,000,000 dead typhoid bacilli and wait a fortnight, it can be shown that his blood serum well diluted will agglutinate or stick together typhoid bacilli where before inoculation it would not do so unless in almost normal concentration. Similarly, should we inoculate with 300,000,000 dead staphylococci the phenomenon of phagocytosis

(or ingestion of bacteria by leucocytes) is more active than before inoculation. There is no guess work in this; it is all cold-blooded determination of biological facts almost as definite as is the difference between a gram and two grams by weight of anything, and yet we are dealing with substances that have never been isolated, but whose presence in one or another amount can be unquestionably inferred by certain delicate biological reactions. No more wonderful is the telephone, wireless telegraphy, the phonograph or many another wonder of physics or chemistry, than this product of the subtle scientific minds of modern investigators of the problems of immunity.

The second proof of the power of dead bacteria to produce antibodies is found clinically in the results of treatment of various bacterial disorders; one may safely say that those who have seriously applied the method of vaccine therapy, or the use of bacterial vaccines in the treatment of disease, are almost unanimously agreed as to their efficacy. Perhaps even more convincing evidence is afforded in the use of dead bacteria for the prevention of disease; one example will suffice. Out of 12,000 American troops camped on the Mexican border for some months a year or two ago, all inoculated against typhoid fever, not one contracted the disease, thanks to the discovery of this method by my distinguished preceptor, Sir Almroth Wright. To him also we owe the epoch making conception that the human organism can be stirred into activity against any bacterium provided we can grow the offending microorganism.

I will now indicate the method of approach towards the treatment of a bacterial

disorder by bacterial vaccines, by referring to the common condition known as "boils," or furunculosis.

*First.* Cultures are made from the pus. These invariably show an organism known as the staphylococcus pyogenes aureus, or the yellow pus forming staphylococcus.

*Second.* A "soup" of these millions of germs is made by pouring over the surface of our cultures a dilute salt solution.

*Third.* The number of cocci in each cubic centimeter of this parent liquor is estimated; the living germs are killed; and then the concentrated "vaccine" is diluted with salt solution, so that each cubic centimeter will contain say 600,000,000 dead staphylococci.

*Fourth.* Two injections of from 300,000,000 to 600,000,000 are given each week for three or four weeks, and with appropriate local treatment we are thus able to control the infection.

And so we proceed in any other case of bacterial infection. It may be necessary to vary the dose or the interval between inoculations; again there may be but one microorganism as in boils, or many as in pyorrhea alveolaris or bronchitis or a tuberculous sinus. In these cases it is necessary to use corresponding vaccines for each organism inasmuch as the tissue response following inoculation is specific for each vaccine.

Having thus indicated the principles of immunity and of vaccinotherapy in general, and particularly with respect to boils, I will now proceed to consider pyorrhea alveolaris. Although I have studied quite a number of cases of this disorder bacteriologically, I have treated very few, and those some years ago. In fact, my results were so indifferent that I lost what little faith I had in vaccines for pyorrhea, but now I know that my failure was probably due to having relied solely upon vaccines—neglecting local treatment.

In the following remarks I am quoting

largely from the papers of two excellent and reliable investigators—Dr. Kenneth Goadby<sup>1</sup> and Leon S. Medalia.<sup>2</sup> The morbid changes in pyorrhea, according to Znamonsky (quoted Medalia<sup>2</sup>) are as follows:—"The disease begins with an inflammatory process of the gum margin at the gingival space; it destroys the epithelial tissues and gradually involves the bones, which latter become necrotic. New bone formation (osteoid tissue) takes place and results in a partial involucrum (a partial encapsulation). It is the involvement of the bony socket which is considered by almost all the observers to be the characteristic feature of the disease."

Practically everyone is agreed that there are two factors concerned in the etiology of pyorrhea alveolaris; the first is mechanical injury to the gum margin chiefly by the accumulation of tartar, but a demonstrable traumatism is not invariable, for the disease seems to occur at times quite independent of any evident or known injury to the gum margin.

The second factor concerned is infection; and here we meet with a striking difference of opinion among those who have devoted special attention to the bacteriological study of the organisms, especially in those cultured from the pus which exudes from the gum pockets. All are agreed that very many varieties of microorganisms can be seen in direct smears from the pus (and I shall not trouble you with further details), but the results of careful cultural investigation are strangely at variance. For example, Medalia asserts that the pneumococcus in chains (*streptococcus lanceolatus pneumoniae*) is by far the commonest. He obtained it in 107 cases out of 112—alone or with other microorganisms; and says that this is the organism which Goadby calls

the streptococcus brevis, found almost invariably by this investigator. At any rate, however numerous and various the organisms observed in direct smear of pyorrheal pus, one commonly finds only a short-chained streptococcus or a pneumococcus.

I hesitate to burden you with the details of the bacteriological investigations of these and other workers inasmuch as sufficient can be set down briefly for our purpose. The other organisms that occur are numerous, but in addition to that just mentioned we have a long chained streptococcus (*streptococcus pyogenes*), *staphylococcus aureus*, *micrococcus catarrhalis*, and a *streptobacillus*. One or all of these may occur in any given case.

Goadby and also Medalia endeavored to determine which organism or organisms isolated were the chief offenders by estimating the resistance of the blood to them by the so-called opsonic index. To my mind there are grave doubts that much assistance was obtained by this procedure, and its very laboriousness excludes it as a practical method in the vast majority of cases of pyorrhea. One consideration alone is sufficient to make us hesitate to use the opsonic method, namely: may not those organisms (such as the spirilla and the bacillus fusiformis, which we cannot grow at all or only with great difficulty) be important etiological factors? At least there is no conclusive evidence that they may not be, although we have certain therapeutic tests that indicate that they are not of essential importance when *alone*.

But are these bacteriological observations only of academic interest? Fortunately no, if we are to credit the best opinions obtainable, and I can see no reason why we should not do so. Certain it is that pus forming cocci are largely concerned in the continuance of this disorder, and so our minds

naturally turn to the principles of artificially acquired immunity and the measures available for inducing it. In other words, we ask ourselves can bacterial vaccines prepared from the organisms recovered from the pus in a given case help to control the morbid process? The answer is probably in the affirmative.

With respect to a case of pyorrhea alveolaris, what is the method of approach if we are desirous of using appropriate bacterial vaccines? The principles are identical with those referred to in the case of boils, only the bacteriology is more difficult. There is only one organism in the pus of a boil, whilst many are found in the pus of pyorrhea, which must be isolated before the appropriate vaccines can be prepared. It is necessary to exercise great care in making the first culture. The gum margin should be thoroughly cleared of adherent foreign matter and then cleansed with several applications of sterile water. If the pus is abundant it is well to press out some of it, remove it, cleanse again with sterile water, and then pass a looped platinum wire into the gum pocket. Cultures are made on blood serum or special blood media in such a way that individual colonies will be found after 24 hours' incubation at body temperature. Portions of all colonies that appear different after careful study are transferred to fresh culture tubes and so grown in "pure culture." We now ask ourselves which of these organisms shall we select for our vaccine? Goadby and Medalia in particular have endeavored to overcome this difficulty by estimating the patient's resistance to each organism by opsonic methods and, indeed, have succeeded in doing so. That is to say, if the opsonic index of a patient's blood was 1.0 (or normal) to a *staphylococcus* isolated from the pus, and

say 0.6 (or  $\frac{6}{10}$ ths normal) to a streptococcus or micrococcus catarrhalis, then the streptococcus or catarrhalis vaccine would be elected. But is this laborious refinement necessary to rational bacteriotherapeutics? I am confident that it is not. Because even if the staphylococcus be not concerned in maintaining the infection, the use of an autogenous staphylococcus vaccine on our patient can do no harm even if it does no good. It therefore suffices to prepare an autogenous vaccine from each organism isolated and obtain a composite vaccine. But how do we standardize such a vaccine? We are able to do this as the result of both laboratory and clinical experience, by which we have learned the optimum dose for the majority of different microorganisms. For example, we use 300,000,000 dead staphylococci, 10,000,000 dead streptococci, 50,000,000 dead catarrhalis as initial doses, and so we put into each cubic centimeter of our composite vaccine these amounts of the three vaccines; and likewise for any others that might have to be considered.

The vaccines are administered hypodermically in the upper arm and two inoculations each week are given.

Now what happens when we introduce our composite vaccine beneath the skin of our patient? Briefly, the tissues responsible for the manufacture of antibodies are stimulated into activity and produce an antibody to each organism that is represented in our composite vaccine. These antibodies find their way into the blood stream and are carried to the site of infection, namely, the gums, alveolar margins, and periodontal membrane, where they participate in controlling the activities of the organisms at work there just as the antibodies to the staphylococcus reach the focus

of infection of the boil, and so assist in destroying the living staphylococci at work.

I shall consider later the evidence as to whether or not this therapeutic measure is of service even in helping to control pyorrhœa alveolaris; in the meantime may I turn to certain general considerations of interest and importance? From the beginning of medicine human endeavor has been particularly directed towards the discovery of a specific remedy for each disorder that afflicts our race, for so we touch a particular spring and lo! the sufferer is well. How this appeals to the imagination; wonder of wonders! Even at this day we are stirred to the ultimate depths of our beings at the announcement of a positive cure for most cases of tuberculosis! And yet how often are we doomed to disappointment! Nevertheless, so keen is modern science in this search that thousands of the acutest scientific minds of our generation are as earnestly bent upon this matter as were Peary, Sir Ernest Shackleton and Amundsen in searching for the poles of our earthly sphere.

But what of the so-called specifics? If we mean by a specific a substance directed against the particular cause of a disease, then we have a few; you are familiar with the use of quinine in malaria and mercury and salvarsan in syphilis. These are the drug specifics. And it is interesting to reflect that none of these disorders is due to bacteria, but to microorganisms more closely allied to the protozoa. The other class of specifics contains the sera—diphtheria antitoxins, etc. And the third the bacterial vaccines.

My contention, however, is that dental surgeons and physicians should not allow their minds to dwell too much upon a specific remedy in a given case, for this reason that it is not simply the case of a disease

itself that they are endeavoring to combat, but more commonly its effects already established in the sensitive human organism. It therefore follows that however definite and complete a specific we may possess, if we are to do our full duty as broad minded practitioners, we must never forget the complexities of the individual sufferers before us.

My work for the past ten years has been chiefly the application of specific remedies to the bacterial disease, but fortunately I have been in close touch with the general practice of medicine, and the further I go the more convinced I am that it is essential for the active immunizer to have clinical knowledge and experience. So in the treatment of pyorrhea alveolaris, to inject appropriate autogenous vaccines and do nothing else is futile, as I have learned to my disappointment. The problem is much greater than that. We must take cognizance of at least three measures if we are to succeed.

*First.* Appropriate instrumental treatment of the foci of infection.

*Second.* Control of the systemic manifestations of the disease.

*Third.* Administration of appropriate autogenous vaccines.

Is it a moot point as to whether gastrointestinal disturbance, physical debility, and mental hebetude precede and prepare the soil for the microorganisms which then gain a foothold in the tissues and cause pyorrhea, or are these secondary to the infection? My own strong belief is that most of the vital disturbances are secondary to the pyorrhea. Certain it is that control of the disease is commonly associated with an improvement in general health, and in those various adjacent or distant manifestations of pyorrhea that have been referred to, in

particular gastrointestinal disorder, joint and skin affections, etc. And it is in the beneficial change that takes place in those conditions secondary to pyorrhea that, by common assent of those who know, we find the most eloquent plea for the use of vaccines.

Of what value are bacterial vaccines in controlling the pyorrhea itself? As an isolated therapeutic measure they are probably useless, but combined with skilled dental treatment and certain general measures, they are of distinct service, according to the full belief of numerous investigators.

But how are we to be certain that appropriate vaccines aid in controlling or curing pyorrhea? I know of nothing more difficult in medicine than to estimate the value of a new therapeutic measure. Are you to accept statistics of an unknown man? Or even of a known investigator? If we do so it is with more or less reluctance, for we know how the desire for achievement, errors of observation or judgment, and over enthusiasm have led us astray from time immemorial. Hence we do not hasten to accept unreservedly the *ipse dixit* of any man. How then do we gather faith out of doubt and scepticism? Either through personal experience or the acceptance as true of the accumulated experience of a sufficient number of men in whose judgment and honesty we have faith. So every remedy that we accept today has had to run the gauntlet of our respective professions before gaining entrance to the fold. I submit that on the whole this attitude of mind is much more likely to lead to the truth than if we should reach out with open arms, and child like embrace each new alleged remedy.

In so far as pyorrhea alveolaris is concerned, a number of capable investigators

report satisfactory results. I shall quote only a few, but these are representative of the views of practically all who have combined vaccine therapy with local and general treatment.

Goadby,<sup>4</sup> 70 cases of early pyorrhea treated by vaccines; 45 cured, 13 relieved, 11 disappeared, 1 died of intercurrent infection. Goadby believes therefore that 60 per cent. of early cases can be cured with the aid of vaccines, and thinks that the outlook is dark for those not treated with them.

Again, Jones and Humphreys<sup>5</sup> report 5 cases with good results.

Eyre and Payne<sup>6</sup> reported the results of the treatment of 26 cases of pyorrhea as follows:—21 cured and remained cured from nine to fifteen months, 4 improved, and 1 died. All these were advanced cases of the worst type. They were all followed up with vaccine treatment as well as local and general treatment.

Beebe<sup>7</sup> reported 17 cases of pyorrhea treated with good results by vaccines.

Medalia<sup>2</sup> also reports excellent results and, inasmuch as his series of cases is the largest yet published and the work undertaken on them so complete, I propose to quote him at some length as follows:

"The results of the treatment have been classified as 'cured,' 'improved' and 'no improvement.' It might be well to state here what I mean by the term 'cured.' I considered a case cured when the local condition of the gums became healthy as to color and firmness, when no pus could be squeezed out of the sockets, when loose teeth had tightened up, and when no inflammatory condition was found; also when symptoms such as bad metallic taste in the mouth, soreness and bleeding of the gums, and tenderness during mastication dis-

peared. The recession, of course, that took place before treatment was begun could not be mended by this or any other treatment: further recession, however, was checked. Finally, when other systemic symptoms present, such as rheumatism, gastrointestinal disturbances, and neuralgic pains also disappeared or were relieved, and the patient considered himself as feeling 'quite well.' When these changes for the better in the patient's condition lasted for several months without a recurrence, I thought I had a right to consider such a case as cured.

We will now discuss the cases under their respective groupings:

*"Group 1. Incipient stage. (14 cases).*

*"Results.* Of 14 cases, 13 were cured, while the remaining one was greatly benefited.

*"Group 2. Moderately advanced stage. (16 cases).*

*"Results:* Of the 16 cases, 15 were cured and one was benefited.

*"Group 3. Far advanced stage. (85 cases).*

*"Results.* In this group of 85 cases, 37 were cured, 40 were markedly benefited, 4 unimproved, and 3 dropped out. One was treated by his dentist and no record obtained from him of the case.

"Of the cured cases, 5 remained cured for from thirty to thirty-six months, 11 from twenty-six to twenty-nine months, 8 from twenty to twenty-four months, 9 from fifteen to nineteen months, and 5 from five to twelve months. The improved cases remained improved for several months or years, some getting progressively better even after discontinuing treatment, while others remained stationary."

I have referred to certain local and distant manifestations of disease associated with "oral sepsis." Of these none is per-

haps so serious and common as chronic arthritis. Most of these cases are included in the two terms, rheumatoid arthritis and osteoarthritis. It is hardly germane for me to consider this question in detail; still it may be of interest to you to know that excellent results have followed the treatment of these conditions by taking cognizance of chronic sepsis of one sort or another. Dr. Stewart Wright, of the Toronto Orthopedic Hospital, and I have been associated in the treatment of quite a number of cases of chronic arthritis, and have been guided by certain principles which I may briefly state.

*First*—We search for a focus of infection. This is most commonly found in the mouth; pyorrhea alveolaris, chronic alveolar abscess, etc. Or the tonsils may be chronically inflamed; or there may be inflammation of the bladder or prostate, or of the uterus, etc.

*Second*—We study the microorganisms found there; isolate them, and prepare autogenous vaccines. These are used to help us control the local infection.

*Third*—We eradicate the focus of infection as completely as possible. For example the pyorrhea as treated locally; the tonsils are enucleated, etc.

*Fourth*—We endeavor to correct deformities by appropriate orthopedic measures.

Dr. Wright will later describe a number of cases so treated, and publish his results. May I anticipate him this much, and say that I feel confident that the results will prove as interesting to the profession as they have to us.

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## FUNDAMENTAL PRINCIPLES IN THE TREATMENT OF FRACTURES.<sup>1</sup>

BY

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This paper is the immediate outcome of a fixed belief that fractures are not as a rule as well treated today as they were 20 years ago.

In my opinion this is due in part to too great dependence upon the X-Ray and a consequent neglect of careful anatomical study and the rules of applied anatomy, both in practice and in medical teaching, and in part to a too ready resort to operative methods and the use of screws, metal plates, and other means of direct fixation. Methods introduced by Mr. Lane and Mr. Milne, of England, looking to immediate rigid fixation, have too often been productive of delayed union, non-union, or faulty end results; and have contributed to the mortality as well as the morbidity of fractures.

I might have called this paper "Fundamental Principles in the Treatment of Fractures Not Usually Observed at the Present Day," for I shall speak principally of

<sup>1</sup>Read before the Washington Surgical Society, Oct. 17, 1913.

methods and practices which are sanctioned by some high authority, but which are pernicious from the fact that they break the physiological rules of bone growth and nutrition.

It has been said that the only thing necessary in treating fractures is to replace the broken fragment, or fragments, and keep them in place until union occurs. This seems simple; but it is not simple if we add the very important item that it must be done without permanent injury to the patient, or the use of any appliance that will interfere with proper union.

The following laws touching bone growth and regeneration should not be forgotten.

(1). *Continued pressure upon bone causes its absorption.* This is well illustrated in many thoracic aneurisms where simple pressure of the growing sac causes absorption and complete disappearance of large portions of rib, sternum, or even vertebrae.

Bony irregularities, interfering with the movement of joints, may also be readily absorbed by keeping constant pressure upon them for a few weeks. It is easy to straighten a flexed and partially ankylosed knee when the ankylosis is due to bony irregularities of the joint surfaces, and not to fusion of the bones or to shortened or fixed tendons. It can be done by simply straightening the knee, as much as possible without pain, and applying a plaster cast. In a week's time the cast is removed and the joint readily gives several more degrees because the constant pressure of opposing surfaces has caused absorption. The process is then repeated and in a few weeks a right angled knee may be made perfectly straight. I have seen Dr. A. R. Shands do this and have done it in

a number of cases myself both with knee, ankle and elbow joints.

Plates, nails and screws also cause rapid absorption of bone upon which they press, if there is continuous tension upon them. Consequently such appliances can not be depended upon to keep fractured long bones in alignment, and though they do prevent shortening, this can be better done in other ways.

(2). *It is impossible to hold down a fragment of bone, tending to ride upward from muscular action, by putting compresses over it.* The result will be absorption of tissues over the fragment and ulceration through the skin. Care must also be taken not to put undue pressure upon bony prominences or ulceration will result.

(3). *Any incision through muscle playing over a bone, down to the bone, may produce scar tissue binding the muscle to the bone at that point, and interfering more or less seriously with motion.* I have seen a stiff knee result more than once from incision through the rectus femoris, made on account of fracture in the middle third of the femur; and once broke the patella in trying to flex such a knee under ether. These were cases of primary union with no evidence of infection. When infection occurs the scar will of course be heavier still. Incision for fracture of the femur should therefore be made to one side of the rectus femoris, between it and the vastus externus preferably, or through the short fibres of the vastus externus or internus.

(4). *Continued irritation of muscles and tendons at the seat of a fracture often produces thickening and contraction of these muscles, or tendons, and such contractions may seriously impair the motion of a joint.* But, unless there has been an

inflammatory welding of the tendons to their sheaths, the contraction will yield, in time, to ordinary use; and I believe it is only when *infection* has occurred that permanent welding results, except in fractures of the wrist where the tendons pass through long synovial tubes.

(5). *Infection at the site of fracture nearly always interferes seriously with*

shot wounds for this reason are according to Dr. Le Garde a thousand times more liable to infection than clean incisions.

(7). *Cutting off the blood supply of a part of the periosteum by pressure is equivalent in effect to removal of this periosteum.*

(8). *Large foreign bodies imbedded in bone frequently cause, without apparent*



PLATE I.  
Case. A. Two views of left arm.

*union*, and even when good union occurs, may cause stiffness of a limb by fusion of muscle and tendon in a manner that can never be remedied.

(6). Mangled and lacerated wounds are far more liable to infection than clean cut incisions. Dirt and other foreign bodies also contribute to infection. Gun-

*infection*, a rarefying osteitis not only in their immediate vicinity but often extending to the whole end of a broken bone, producing a conical point that will not unite with the other fragment.

This is particularly true of screws and of wires passed entirely through the medullary canal, or deeply into it.

These laws are as fixed and immutable as the laws of the Medes and Persians and the ignoring of some of them has led to pernicious methods of treating fractures that have come into common use under the sanction of high authority. If these laws are true it is self evident that short fragments may be held in place by

by wires passed through and through the broken ends. The Lane plate breaks three of the fundamental laws that should govern the treatment of fractures. *First*, it causes continuous pressure of screws upon portions of the bone where absorption is undesirable. *Second*, it is a large foreign body causing, in at least 33 per cent. of



PLATE II.

Case A. Both arms of same case. Shows rarefying osteitis and screw holes where plates were. Lack of callus on side plate was applied. Both plates had to be removed, but the right ulna united beautifully because nothing was done to it. Left radius, though wired, and though there was much loss of bone, united much better and quicker than right ulna which was plated.

wiring. But that no appliance should ever be fastened directly to the ends of a broken long bone *with the purpose of keeping the fragments in proper alignment; but only to prevent shortening.* The alignment must be by splints, casts, or extension—never by metal plates screwed to the bone, or by bands of any kind encircling the bone, or

cases, a rarefying osteitis resulting in delayed union, or non-union. *Third*, it destroys by pressure a considerable portion of the periosteum.

These results are *not* dependent upon *infection*. They occur in wounds healing by primary union as well as where infection and suppuration result. When both bones

of the fore-arm or leg are broken, and a Lane plate is applied to one bone, but not to the other, it often happens that the bone to which the plate is applied fails to unite, while good union occurs in the other. This proves that the non-union is not due to infection, nor to any general or local condition of the patient—but to the plate itself

fore-arm 20 days after wiring and plating. The radius is badly wired. A single small loop would have been sufficient. Still, union resulted in three months, in spite of the clumsy wiring, and loss of bone, as shown in the plate. In the ulna, however, which is not so badly fractured, and which is apparently held in much better position by a

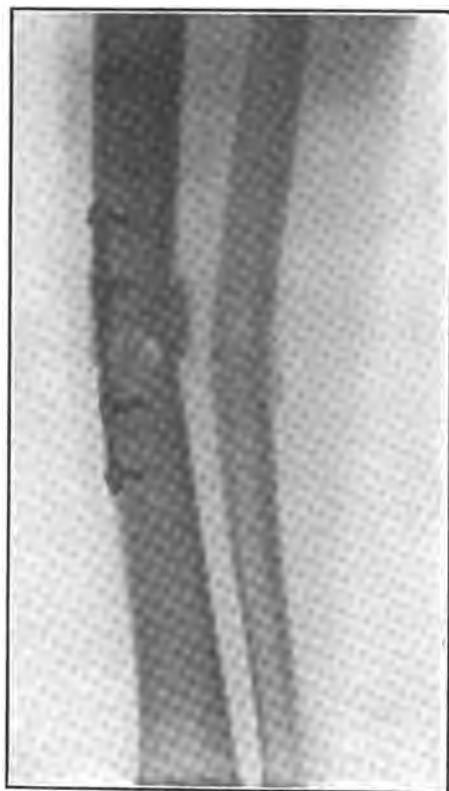


PLATE III.

Case B. Non-union of tibia until after union of fibula was good and plate removed. There was prompt union of fibula but no union of the plated tibia until plate was removed.

and the screws used to attach it. Dr. Harry S. Lewis, medical Superintendent of the Emergency Hospital, has kindly loaned me a number of photographs showing this feature and other evils of the Lane plate and faulty wiring.

*Case A*, Plate 1, shows two views of the

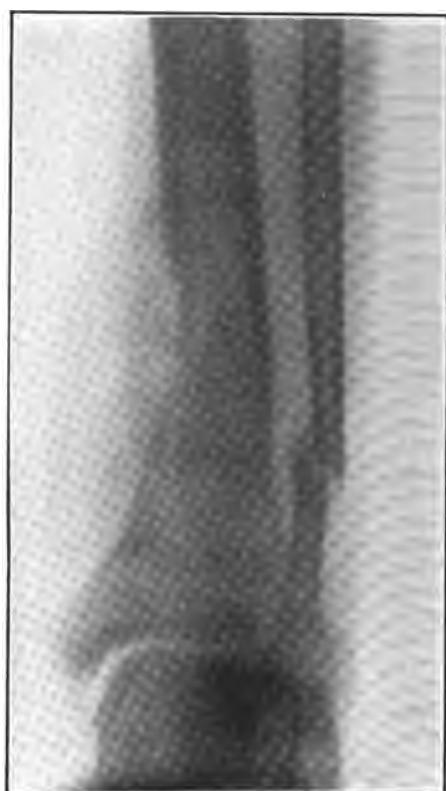


PLATE IV.

Case C. No suppuration. No union until plate was removed. Note the good callus on fibula where no plate was used—and the well marked rarefying osteitis on side of tibia where plate was applied. Final result good after 3 months.

Lane plate, there was no union after 3 months, nor until 5 weeks after the plate had been removed. This patient broke both bones of both arms and the next plate shows the condition in both arms four and a half months later.

*Case A*, Plate 2<sup>Dig Both arms of same</sup>

case after four and a half months. Perfect union in right ulna which was neither plated nor wired. Good union in left radius though clumsily wired. Part of the callus has ossified and can be seen. Neither of the plated bones showed any sign of union after 3 months. After waiting that length of time the plates were removed and

absorbed away on the side to which the plate had been attached; and how the callus bulges out on the other side. I have seen this condition in many cases. It is typical. Absorption around the screws, and on the side of the plate, and building out of the callus on the side opposite the plate; with delayed union or non-union. And



PLATE V.

Case D. Two months after removing plate and 6 months after fracture. Good union—only slight bow showing—not noticeable with pants on.



PLATE VI.

Case D. Lane plate applied.

the right radius wired. In 6 weeks more fairly good union had occurred in both bones. Notice the rarefaction of the ends of the right radius, the pointed ends, and the absorption of bone where the screws have been. There is now, however, a fairly good callus around the wire loop. Notice also how in the left ulna the bone is

this condition is *not* due to infection—certainly not due to *pyogenic* infection. It occurs in cases of primary union as often as where suppuration supervenes.

Case B, Plate 3. Tibia Plated. Prompt union of fibula. No union in tibia until 2 months after removal of plates. No suppuration; final result good.

*Case C, Plate 4.* Plate to tibia, No union after 2 months but good union in unplated tibia. Plate removed and good union resulted in another month. This plate shows well the absorption of bone where plate was applied. No suppuration at any time.

*Case D, Plate 5.* Plate to femur. Four months later plate removed. No union.

weeks after operation. Plates removed two months later for irritation of skin and threatened ulceration. Prompt healing followed.

*Case F, Plate 8.* Plated femur. No union after eight weeks. Suppuration finally occurred, and the plate was removed, when wound soon healed and good

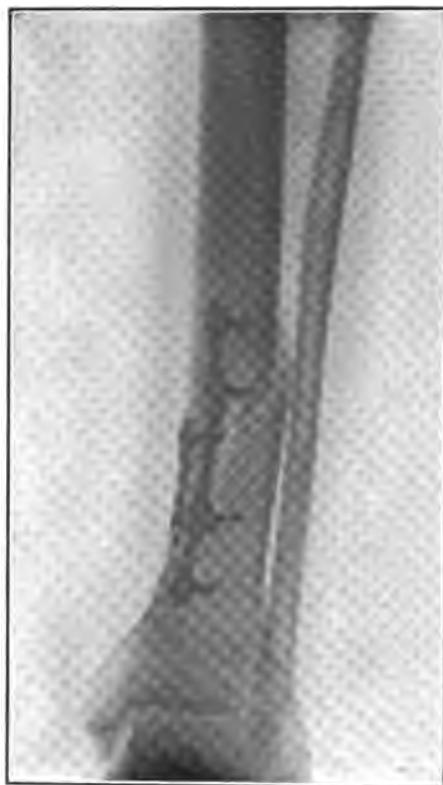


PLATE VII.

*Case E. Final result good—but plates removed 2 months later for irritation of skin and threatened ulceration.*

*Case D, Plate 6.* Same case six months after injury. Firm union occurred two months after removal of plate. Some angulation. Note the rarefaction of bone on side plate was applied, and excessive callus on opposite side. No apparent infection at any time.

*Case E, Plate 7.* Plates in situ two

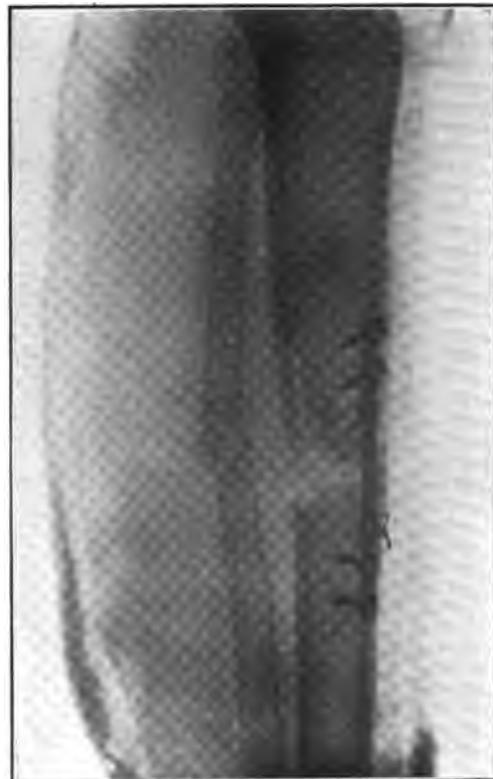


PLATE VIII.

*Case F. Lane plate applied—non-union. Finally suppuration was caused by plate and it was removed.*

union resulted though the wire loop used in addition to plate was not removed.

*Case F, Plate 9.* Same case showing wire after healing and good union.

We have, at the Emergency Hospital, numerous other plates showing similar bad results from the use of Lane plates. I have given only a few, but they are typical.

I have never used a Lane plate myself, but have records, furnished me by the Superintendent, Dr. Lewis, of 54 cases in which the plates were used, by a half dozen of our most competent surgeons. In 30 of the 54 cases the plates were removed, for non-union, suppuration, irritation, breaking or bending of the plate, or because the screws came loose in the rarefying bone and

results in most cases are due to infection of any kind, but to the breaking of the laws above noted.

A careful study of the skiagrams in my possession will, I am sure, convince any fair-minded person of the danger of using any appliance screwed or banded directly to a broken long bone *for the purpose of keeping the fragments in alignment.* The

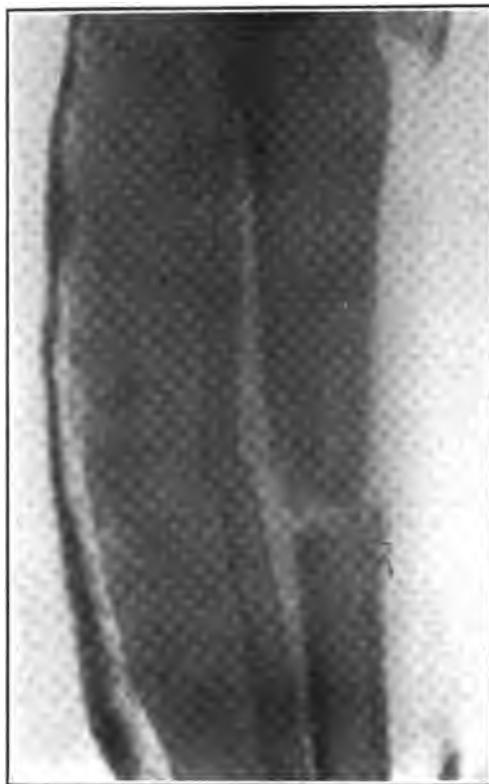


PLATE IX.

Case F. Plate removed and bone wired properly. Final result good.

failed to hold the bones in position. Some of these surgeons have abandoned the plates. Others, after being reassured by Mr. Lane in Chicago last November that all the trouble is due to infection and faulty technique, have announced an intention to continue their use with greater care in the rigid technique insisted upon by Mr. Lane. Personally I can not believe that the bad

leverage is too great to be overcome in this way without producing a pressure too great, and the mass of foreign material is too large for safety or prompt union. It is not a difficult matter to keep broken bones in *alignment* with splints, extension, or casts, combined with proper position of the limb; but it is sometimes impossible to prevent shortening or prevent the riding up, or

out, of the end of a short fragment pulled by some powerful muscle, without some form of direct fixation. For this purpose a single small loop of wire if properly applied will answer perfectly in all cases where there are but two fragments, and one small wire loop for each of the larger

wires, as I shall endeavor to show a little later. In a rather large experience of over 20 years in treating fractures I have never seen non-union, or serious trouble, come from a few wire loops properly placed. Even a small loop of wire does, in some cases, produce rerefring osteitis; but only

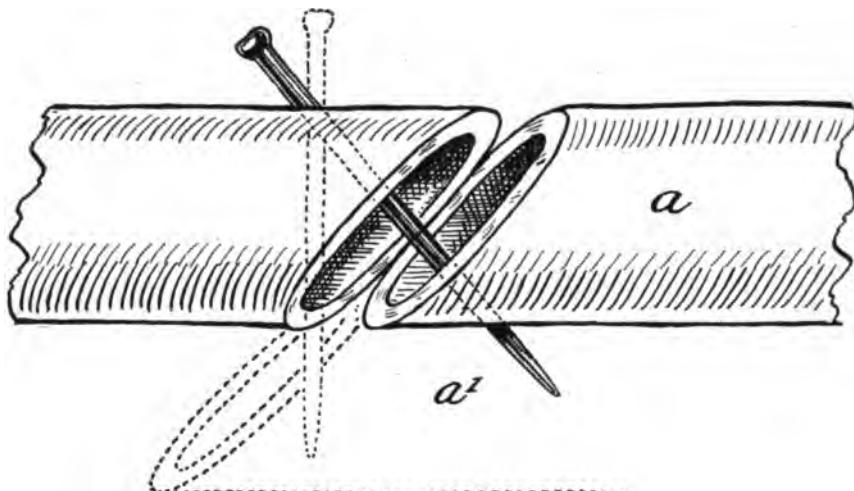


FIG. I.

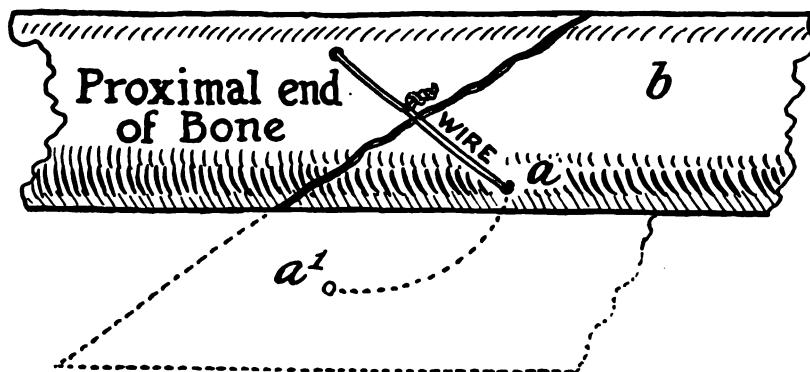


FIG. II.

fragments in a comminuted fracture would suffice. These loops of wire should never pass through the medullary canal and it is not necessary to fasten every little fragment in a comminuted fracture. The question is one of simple mechanics. There is a wrong way and a right way of placing the

in a small localized area which never interferes with good prompt union.

Even when suppuration occurs, and the wire comes away, sometimes with one or more small fragments of bone strung upon it, good union has usually first occurred, and no serious damage is done. The rou-

tine wiring of fractures is wrong. Open treatment is not needed, nor indicated, in most simple fractures; and perfect results may be obtained in such cases by extension or plaster casts. It is only in fractures of the femur just below the lesser trochanter, where the upper fragment is tilted by psoas and iliacus muscles, and in fractures just above the condyles where the lower fragment is drawn down and backward by the gastrocnemius, and in fractures about joints,

results by simply replacing the fragments and applying a cast. This of course is only when muscular action tends to hold the broken ends in position, in transverse fractures, or where irregularities in the broken ends lock into each other so as to prevent displacement.

Personally I am a little chary about leaving bones in this way, after cutting down upon them, as there is always some danger of displacing them while applying the cast.

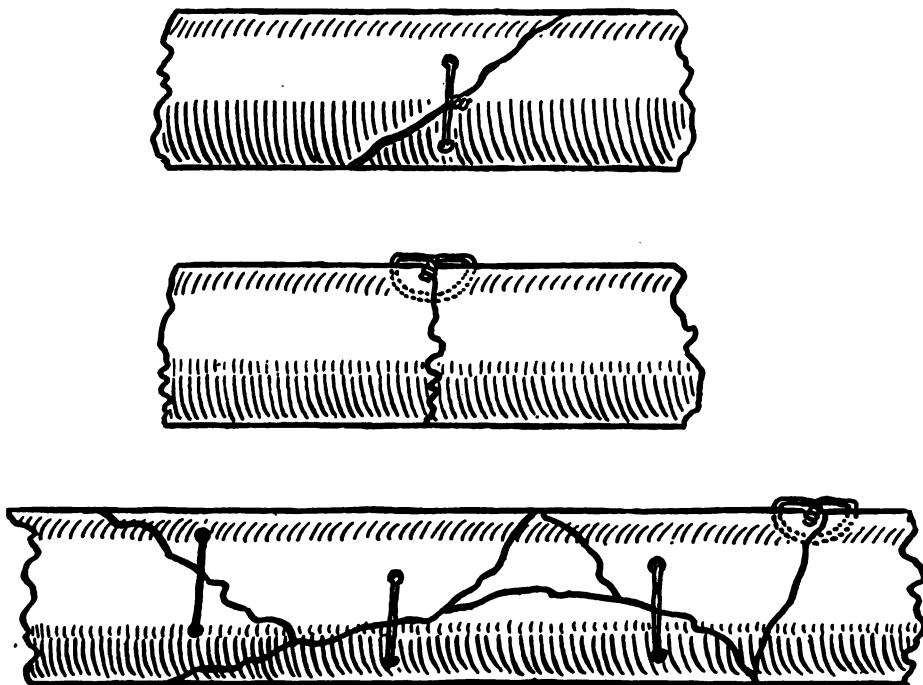


FIG. III.

where short fragments are displaced, that open operation is commonly needed; and in complete transverse fractures of the patella. In unusual cases, too, a fragment of bone may become tucked under a muscle in such a way as to require open operation to get it reduced. But even when open operation is done it is not *always* necessary to fix the fragments with any direct appliance to the bone. Dr. Shands has had many excellent

I prefer to make sure of the position by anchoring with a simple loop of wire, or by using a dowel pin of some convenient loose fragment of bone, a method frequently used by my colleague in the Emergency Hospital, Dr. Geo. Tully Vaughan. Some of my friends have been using Lane plates because, they say, they could not get the wire to hold the fragments in place, even when several loops are put in, where one

should be sufficient. Remember that the tendency always is to overlapping and shortening, because there are always muscles in a state of tension pulling the distal end of a broken long bone toward the body. If the wire loop is placed at right angles to the line of fracture, in an oblique fracture, shortening will always result, and will be greater the longer and larger the

1, would hold the ends in position. But driven in the same way through a bone tube, will soon assume the position of the nail in dotted line. The distal fragment *a*, will then assume the position *a*<sup>1</sup> also shown in dotted line.

The same principle holds in wiring bones. A wire loop placed as shown in Fig. 2 will invariably swing round from *a* to *a*<sup>1</sup>, and



PLATE X.

Case G. Partial displacement due to wrong wiring—but final result good.

loop used. The loop should be short and the wire should run at right angles to the shaft of the bone. If this rule is observed there can be no shortening.

Remember that a long bone is not a solid rod, but is practically a tube.

A wire nail driven through a solid rod in a manner similar to that shown in Fig.

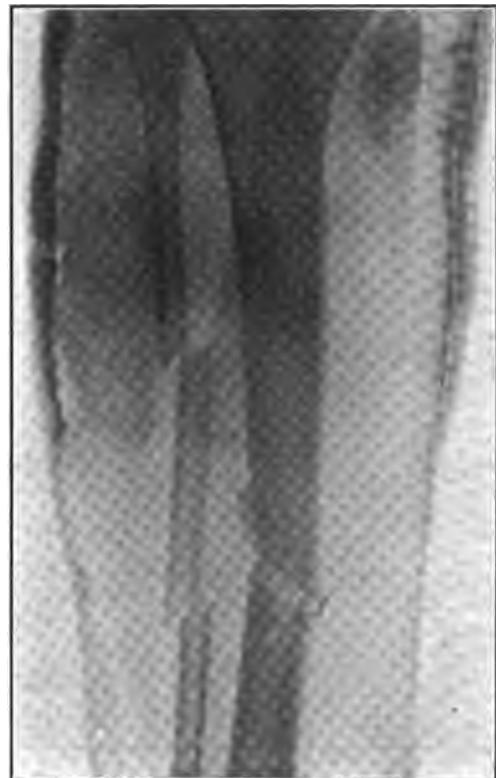


PLATE XI.

Case G. Fracture both bones of leg. Properly wired—but not quite properly aligned by cast.

the distal fragment *b* will assume the position shown in dotted lines.

Plate 10 shows this condition as it actually occurred in spite of the fact that two loops were used.

As absorption takes place and the wires cut through the bone as they always do to some extent, this condition will become

worse, and the shortening and deformity greater. And yet some high authorities have said that the wire loop should always be placed at right angles to the line of fracture! Is it any wonder that bad results have followed, and that other means of fixation have been sought?

There is no fault in the use of wire. The fault is in the manner of using it.

Done in this way there can be no slipping or shortening. And, when one has mastered this really simple proposition, he will feel no need for any other method of fixation except in *very* unusual cases.

I have a very small brace and bit drill, for use in one hand, made for me by the Kny Scheerer Co., that bores rapidly, and greatly facilitates the making of holes, as



PLATE XII.

Case G. Two months later. Good result. No rarefying of bone. Deformity too slight to notice.

And the shorter and fewer the wire loops the better they will hold, and the better will be the result, provided the loops are *properly placed and secured*.

Fig. 3 shows the proper method of wiring oblique, transverse, and multiple fractures.



PLATE XIII.

Fractured femur. Properly wired.

it leaves the other hand free for holding fragments. Passing the wire from within outward is made easy by the use of a small grooved director, made of very thin steel. This director passes readily through a small drill hole and still leaves room for

free passage of a good sized wire. I never use a drill larger than  $\frac{3}{32}$  inch.

In applying a cast, after wiring, great care must be taken not to flex the bone at the point of the fracture, and break the wire by force of tremendous leverage, and the limb should always be carefully "sighted" from all angles to see that it is in perfect alignment before the cast is complete and immovable.

The loops are too long, and one would have been all sufficient; but the result is perfect. Notice there is no rarefying osteitis showing in any of the *wired* cases. If it were due to infection it should occur with wiring as often as with plating—but it does not.

Plates 15 and 16 show the excellent result of wiring a bad fracture of both bones of the leg. The small loop held the bone.



PLATE XIV.

Excellent result following proper wiring.

Plates 11 and 12 show how well a single wire loop will control shortening.

The alignment is not perfect, but that was due to carelessness in "sighting" the limb when the cast was applied.

Plates 13 and 14 show a bad fracture of the femur held perfectly by wiring.

The larger loop was useless and would not have prevented slipping and shortening, and just to show what perfect results may be obtained in simple fracture of one or both bones of the leg *without* operation, I put in Plates 17 and 18.

Let me say in conclusion that I know I

am running counter to some high authorities in condemning the Lane plates, and Mr. Milne's bands, which are worse, but I have seen so *many* bad results from the use of the plates in the hands of others that I feel it my duty to call attention to the above facts and to point out the absurdity

at least a third longer for the bone to unite, often half as long again or twice as long as under non-operative treatment or simple wiring. The delayed union has been attributed to more perfect fixation, but I believe it is due to rarefying osteitis caused by the plate and the screws entering deeply

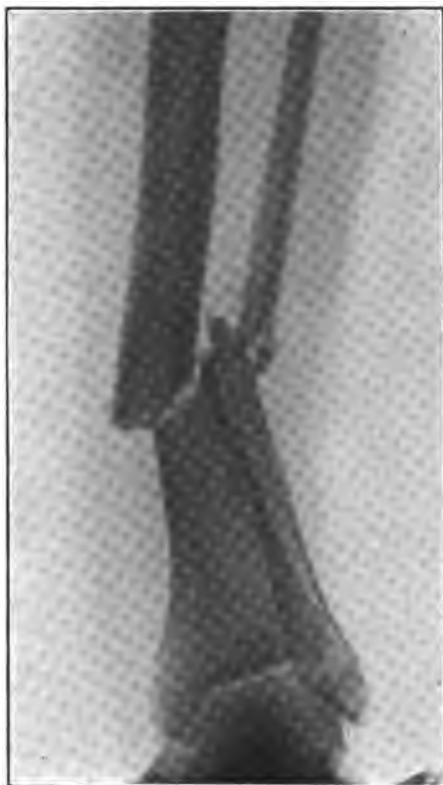


PLATE XV.

Bad fracture, both bones of leg properly wired.



PLATE XVI.

Excellent result from proper wiring. No rarefying osteitis.

and uselessness of trying to maintain alignment in such a bone as the femur by any apparatus screwed or banded directly to the bone.

A number of excellent surgeons in this city and others, particularly in Chicago have told me they *always expect delayed* union with the Lane plate. That it takes

into the medullary canal.

This delayed union, no matter what the cause, is enough to condemn the use of plates, when the end for which they are applied can be safely met in a better way.

I want to emphasize the fact that the plates must at best be regarded only as preventing slipping of the fractured ends

and shortening, and that even with the plates applied most firmly we must depend upon casts or splints to prevent angulation. And especially I wish to show that the slipping and shortening can be prevented by wiring, much more safely, much more quickly, and just as effectively—provided

## THE PRACTICAL SIDE OF VACCINE THERAPY

BY.

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Detroit, Mich.

Nearly a decade has elapsed since the use of bacterial vaccines in the treatment

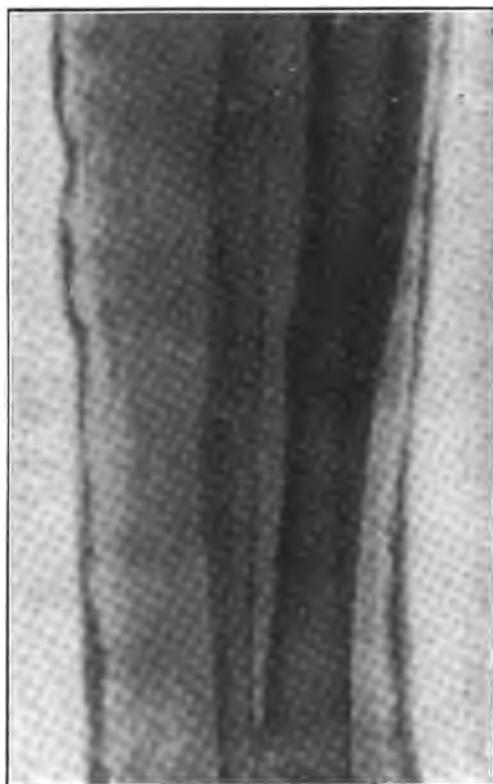


PLATE XVII.  
Excellent result from simple cast.

the wiring be done in accordance with the simple rules of mechanics.

1418 L St., N. W.

Don't urge the radical operation for frontal sinusitis unless the symptoms are severe or conservative efforts have failed; the operation is disfiguring and the results are not always satisfactory.—*Am. Jour. of Surgery.*



PLATE XVIII.  
Excellent result from simple cast.

of infectious diseases was first begun, and it may be fairly said that any method of treatment which has passed through so long, so rigid and so thorough a probationary period must be ready for appraisal. The storm of extravagant enthusiasm with which a new remedy is apt to be greeted, has certainly passed after ten years; there has been sufficient time to ascertain whether

theoretical presumptions are borne out by practical experience; and, indeed, there must exist a great mass of actual proofs, tangible and verifiable data, clear and conclusive findings, necessary for a final judgment.

A priori, it may be said that in modern medicine no absolutely worthless remedy has had more than a brief existence in the medical armamentarium. It goes up like a rocket and comes down like a stick. When, therefore, a therapeutic procedure is more widely employed day by day, month by month, year by year, when it never loses and ever gains in appreciation, there is at least a strong presumption in favor of it. All this applies to the stock vaccines. They have obtained such support as the law of the survival of the fittest is capable of supplying.

But, it may be said, all this is more than counterbalanced by the antagonism which they have encountered in high quarters—even at the hands of bacteriologists and pathologists of undoubted reputation who have in no unmistakable terms expressed their disapproval of them. The *ex cathedra* statements of authorities, however, associated either with highly speculative argument or with no argument at all, cannot be considered final. Whether a man be professor at a university or a humble practitioner, the assertions he makes must be equally amenable to proof. Recently, one of Detroit's progressive general practitioners told me that he sees on the average about three hundred patients a month at his office of which ninety-five per cent. are treated with vaccines. In his extensive visiting practice vaccines are also used. Stock vaccines are usually employed but occasionally autogenous vaccines are resorted to. He started to use bacterial vaccines over six years ago while serving as an

interne in Harper Hospital and encouraged by the good results obtained has continually extended their use. Is it heretical to say that the observations of such a man are more trustworthy than the dogmatic opinions of a college teacher who has never used vaccines at all, whose condemnation is based on mere theory? A single flaw in an elaborate theorization, an inadvertent oversight of some fact or the inclusion of a fallacy in the reasoning, constitutes a fatal defect in the most beautiful intellectual edifice. An academic man is apt to proceed from the syllogism—"Since I know the laws of Nature, and since the alleged fact is contrary thereto, it is plainly impossible and no time need be wasted in examining it." This attitude of mind has been called *misokainia*—hatred of the new, and it is one of the most serious bars to human progress. When Galileo asked one of his contemporaries to convince himself of the powers of the telescope, the latter said, "I would not thus insult God." Finally prevailed upon he raised the instrument to his shut eye—and triumphantly announced that he could see nothing. When the phonograph was first demonstrated in the French Academy, one of the members of that august body left the hall in great indignation, stating that he had made careful investigation of the thing, but found it to be fraudulent, because it was impossible for vile metal to perform the phenomena of human phonation.

Perhaps an analogy can be found in the reception accorded to stock vaccines by some of our present-day scientists. A perusal of certain publications shows a most curious contradiction of hypothetical assertions regarding vaccines and a complete absence of practical deductions from actual clinical experience with them. Some assert that one should expect results from vac-

cines in localized infections; others that generalized processes are the legitimate field of use, and so modify the statement that the indications for the use of vaccines become as limited as Puck's advice regarding marriage: 1. Not after the age of forty; 2. Not before reaching two score years.

A distinguished leader of medical thought told the writer that vaccines should be used only in acute processes, because in chronic ones the system produces its own antibodies. An equally distinguished physician in New York maintains just the reverse—in acute infections give the patient a chance to manufacture his own antibodies, while in chronic ones you can use vaccines in order to stimulate the production of defensive forces.

But stock vaccines have been most seriously attacked on the ground that they do not contain the precise strains which are actually present in the infection itself. It has been urged that a bacterial examination must first be made, and that then an autogenous vaccine be employed. Stock vaccines have been condemned as "unscientific shot-gun mixtures."

These objections sound plausible enough on the surface but do not stand the test of critical analysis. The clinical results obtained show that a vaccine need not necessarily contain absolutely the same strain of streptococcus that is present in the infection. There are real immunizing effects from different types of streptococci toward each other. Clinical experience tends to show that even pneumococci will immunize against streptococci and *vice versa*. This can readily be accounted for on the ground that the pneumococcus and streptococcus are closely allied organisms and may be converted under special conditions from one to the other. The element

of time is a far more important factor in the use of vaccines than complete identity of vaccine with infective organisms. If the clinical signs indicate the presence of a streptococcus infection, the results will be far better when a polyvalent stock streptococcus vaccine is promptly injected than when the slow, cumbersome process of taking a culture and making an autogenous vaccine is resorted to. Meanwhile, a culture for the purpose of making an autogenous one may be procured, but it will generally be found that the infection is under control by the time the autogenous vaccine is ready for administration.

There has been so much written and said about the superior virtues of autogenous vaccines that, when a severe case of infection is encountered, the attending physician's mind often runs in that direction. Recently a doctor wished me to prepare an autogenous vaccine for a puerperal case. Upon inquiry, it was found that the patient had been sick for four days and had a temperature of  $106\frac{1}{2}$ ° F. Obviously, if anything was to be accomplished, treatment could not be delayed for a bacterial examination for making an autogenous vaccine. A mixed stock vaccine containing streptococci, pneumococci, straphylococci and colon bacilli was given at once, with the result that the temperature dropped to 101° in twenty hours. After four more inoculations the patient made a complete recovery.

A case of Caesarean section in which a midwife and two physicians attempted a delivery before the operation, developed a fever reaching 105° on the sixth day. The patient was taken care of in one of our best hospitals by an excellent surgeon but no vaccines had been given because of lack of confidence in their therapeutic value in extreme acute infections. The same com-

bined vaccine that was given to the other case was suggested and given as a last hope. The patient was much improved the next day when another dose of the same vaccine was given. The patient made an uninterrupted recovery.

These are not exceptional cases. Many similar cases might be cited and naturally it is better to treat these cases before they are so far advanced. In my rather extensive experience no case has terminated fatally where mixed stock vaccines were used reasonably early.

Many infections are of such a nature that the infecting organism can not be procured for the purpose of making an autogenous vaccine in which mixed stock preparations give good results. In this class of cases, autogenous vaccine users often go to extremes by making the vaccine from organisms found in some part of the body that may have no relation to the disease under treatment.

It is, of course, true that sometimes an unusual organism is responsible for an infection and that the use of stock vaccines fails to clear it up. In such cases, which are infrequent, a culture examination and an autogenous vaccine will be most useful. But it is also true that stock vaccines will often give results where autogenous vaccines fail. This may be accounted for on the ground that a stock vaccine hits the immunization mechanism from a number of different angles instead of from a single one; it is made from carefully selected cultures which are intense immuno-producers; and, if properly selected, it will in all probability meet the pathogenic organisms present, while in making an autogenous vaccine there is always a chance of missing an essential pathogenic bacterium.

As to the objection that stock vaccines contain species of bacteria which are not actually present in the infection, it loses its point also. Vaccines are harmless; no injurious result has ever been reported even from doses which far exceed those commonly given. Why not, therefore, give a combined stock vaccine which will act prophylactically as well as therapeutically? Diphtheria anti-toxin is given on the suspicion that diphtheria bacilli may be present in the throat; why not a vaccine containing the other organisms which are likely to make a habitat there? Typhoid vaccine is given prophylactically; why not a gonococcus vaccine which contains, in addition to the specific germ, those organisms which are common secondary invaders of the urethra? It is not fair to call this "shot-gun" treatment. The word "shot-gun" was coined for prescriptions which contain therapeutic incompatibilities; the vaccines, however, answer the purpose of a synergistic remedy, each constituent playing a definite therapeutic or prophylactic role.

Furthermore, careful study shows that most diseased conditions are due to a comparatively small group of organisms and most of these organisms gain entrance into the body through the mucous membranes. In the respiratory tract the most important invaders are the pneumococcus, streptococcus, staphylococcus, the microcococcus catarrhalis and Friedlander bacillus. In the digestive and urinary tract we find the colon bacillus, streptococcus, pneumococcus and staphylococcus. To vaccines which meet the bacteria usually found in the infections of the respiratory tract or those in the digestive and urinary tracts, the criticism of being unscientific can certainly not be fairly applied. Even in the specific infections such as whooping cough, measles, scarlet

fever, influenza, gonorrhea, etc., these ordinary pus organisms play an important role in the disease process, and for this reason the patients should receive mixed vaccines.

Theoretical preconceptions can not ultimately prevail against the facts of experience. Clinicians and physicians throughout the world are recognizing the importance of bacterins in medicine, and no amount of opposition can stem the tide. "Surround truth by bitter denial and contradiction," said Carlyle, "and you furnish it with the soil for its permanent growth." No better demonstration of this fact can be found than the gratifying growth of bacterin therapy—even now the subject of intense animosity. We all know how inadequate drugs are in dealing with infections. Almost all they can be expected to do is to support the patient while the natural defenses effect a cure. If Nature's unaided defenses were always adequate to meet the requirements, physicians would not be necessary but unfortunately they do not always come to the rescue in time. In this connection it should be realized that infections usually appear in localities, small portions of the body being attacked, and that the defenses are essentially created in the involved tissues. This appears to hold good even for general infections in which the germs circulate in the blood, because no material immunizing responses develop until the infection localizes in some tissues. By using bacterial vaccines, we take advantage of Nature's methods for overcoming infectious diseases. At the point of inoculation healthy tissue is actively stimulated to the production of germ-destroying substances which are absorbed into the general circulation and aid in overcoming the infection.

Tissues in which pathogenic bacteria have localized make, in due course of time, an attempt at immunization; but this attempt is combated by the activity of the living bacteria, and as tissues become de-vitalized, the bacterial invasion progresses *pari passu*. When a bacterial vaccine is injected, the tissues make the same effort to produce immunizing bodies, and in this effort they are unhindered by any such opposition as living bacteria exert. The injection of a bacterial vaccine, therefore, sets up a vigorous immunizing response to the benefit of the process going on in the infected tissues, where the production of antibodies is no doubt hindered.

The foregoing is advanced as a working hypothesis rather than as a demonstrated law. At least, it fits the facts, and must hold this ground until a more satisfactory explanation is advanced.

No one will contend that bacterins take the place of all other therapeutic procedures. Where a nasal malformation exists, it must be corrected before the infection can be mastered by means of vaccines; in gonorrhreal urethritis the vaccine will check the deeper-seated infection, but local treatment is necessary to combat the organisms located on the mucous surfaces; in surgical sepsis, pus pockets must be evacuated; and in medical infections the indications for the usual remedies must not be disregarded. What is claimed for the vaccines is that they are harmless and effective means of arousing the immunizing mechanism of the body.

Infections that have resisted other methods of treatment, such as chronic catarrhs, bronchitis, bronchial asthma, and ozena, with few exceptions, may be cured with an appropriate stock vaccine in a comparatively short time. Most of the rheumatisms are

also amenable to vaccine treatment. In acute infections the course of the disease is cut short or the disease modified. In short, vaccine therapy is applicable in almost all infectious diseases. Because this fact is becoming recognized, leading men in the various departments of medicine—oto-rhino-laryngology, urology, dermatology, phthisiotherapy—as well as progressive general practitioners have taken up bacterin therapy in their daily work, and have acknowledged that the prejudice against it was unfounded. Bearing all these facts in mind, the status of bacterial vaccines may be briefly summarized as follows:

1. Used early, they will generally cut short the common pyogenic infections of the skin, mucous membranes, and joints and muscles.
2. Administered in advanced cases, they will usually ameliorate or abbreviate the course of the disease.
3. Even when given as a last desperate expedient in acute processes, they will often reverse the prognosis.

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## PHYSIOLOGICAL SURGERY.

BY

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The sun of yesterday has set upon the brilliancy of the surgery of the past. Robert T. Morris calls this the surgery of the third era. There is no doubt that such surgery has demonstrated to all the scientific world that when the human body is to be mutilated, if it is done aseptically, antisceptically and scientifically, patients usually

recover from such operations. There was a time when the surgeon was satisfied that the "operation was a success, even though the patient died." Today, the operation, no matter how extensive, is a success and the patient must live at least long enough to prove it. There are many patients who are living witnesses to the fact that they are worse off after the operation than they were before it. There are many more who will tell you that while life is maintained they are no better now than before some extensive, but eminently successful operation was undertaken for their relief. Now, as ever, we worship the rising, and not the setting sun. In doing this we must not forget the good that has been accomplished. On the contrary we are appreciative to a high degree. We have seen that when surgery is properly and skillfully performed there is hardly any limitation to its extent as far as human life is immediately concerned.

Enthusiasm knows no bounds and as a result the surgeon sees only "the operation" and its immediate consequences. The fact that the patient did not die from the disease for which he was operated, at least not within reasonable time, was sufficient justification for operating. Not only that, the moment operations become a safe thing to do, the surgeons had to be kept busy. How many unoffending kidneys have been anchored, how many offending kidneys been replaced without any benefit to the patient? How many times has the uterus been stitched to the abdominal wall, only in a few months to return to its former position of prolapse, how many times have the round ligaments been shortened only again to stretch as before? How many unoffending appendices are being preserved in alcohol instead of performing the function for which they were intended? You may

ask the question, do you know this function? The answer is "no, I do not." Because the function has not yet been proven is no guarantee that it does not exist. Because man can live without it, is no proof that it has no function.

A man may have no brain, at least be lacking in that portion which furnishes intelligence, yet he lives. It may even be admitted that some men live as well without their brains as others without their appendices. How many women have been uselessly unsexed for all sorts of reflex pains? Were they any better after the unsexing? Not if their tales of woe are to be believed. How many unoffending intestinal "kinks," evolution bands and adhesions are going to be removed since Sir Arbuthnot Lane of London pointed out their existence? According to Sir Arbuthnot Lane these kinks are the results of adhesions forced upon the human being for having departed from his foreordained destiny to walk upon four instead of two legs. We are told that if we had kept on walking in a horizontal instead of in a perpendicular posture, the belly wall would have acted as a sort of apron and supported the abdominal contents. Because we did not do it, nature in her wisdom was obliged to furnish us with these "evolution bands." As a result of these adhesions overdoing their business, the kinks were formed with the result that the intestinal contents remained too long and poisoned the system. Sir Arbuthnot Lane is of the opinion that if these intestines are freed or better still if they are "short circuited" then such diseases as cancer, Bright's disease, rheumatism and tuberculosis will disappear from the earth. Would that such were true!

Dr. Bainbridge, (*Med. Rec.*, Sept. 27th, 1913) states "While we may not accept all

his views (Mr. Lane's) with reference to the relationship between intestinal stasis and tuberculosis, cancer, rheumatism and other diseases, etc.," .... the history of man is traceable without doubt for 10,000 years. During all of this time man has walked upon two instead of four legs. Ten thousand years were necessary for nature to step in and form these evolution bands to our detriment. A sad commentary upon the "*Vis medicatrix Naturae*." On the other hand the quadruped has walked an equally long time upon all fours. The monkey who spends an equal time between walking on four and two legs has not shared in any of these evolutions of intestinal suspension. Nature has certainly neglected her reparative process here entirely. It is not noticed that the belly wall of the animal is any stronger than it used to be nor are there any bands of adhesion formed by the continuous contact of the intestines with the belly wall, neither have their attachments at the spinal column sagged or stretched. In fact, if you take a lateral view of an Italian greyhound, you would hardly suspect that he had any intestines in his belly at all. The fact remains that these bands are there in the human being. Eastman, of Indianapolis, has shown the existence of peritoneal folds in the fifth fetal month. As he says, "They are either anatomic or pathologic entities and surely are not brought into existence by any artifice of traction or manipulation." If all this is true we can come to only one logical conclusion, and that is, that we are all wrong and as time goes on will be more wrong and will have to be made over or change our habits. There is a silver lining to every cloud.

Day is breaking, the first rays of the sun are manifesting themselves upon the

horizon. The writings of Crile and Ochsner have penetrated the mist closely followed by the scintillations of Morris in his physiologic surgery.

Robert T. Morris says: According to the fourth or physiologic era of surgery, dependence is to be placed upon the patient's inherent protective factors and we are to employ the least degree of surgery which will suffice for turning the patient over to himself—giving him home rule. According to the principles of the physiologic era, the surgeon in cases of violent infection is to merely turn the tide of battle between the body cells of a patient and the invading army of bacteria. W. S. Bainbridge states "The treatment of the less severe types, in which the stasis is due to an atonic or asthenic condition, with general loss of muscular and nervous energy is entirely non-surgical."

My interest in physiological therapeutics compels me to view the outlook even more cheerfully. When, therefore, we speak of "evolution bands" they mean little to us because we have no record as to the intestinal conditions of our predecessors of a few hundred years ago. So at best such a theory can only be problematical. On the other hand we do know this—that man was a herbivorous animal originally; partly by environment and partly through necessity he soon became a herbocarnivorous animal. The teeth and his entire digestive tract were in harmony with his feedings. Later as civilization had progressed he became the object of the patent food industry. Today the more concentrated a food can be produced the better the people seem to like it. In riding in any of the public cars, you will see the advertisement of a great American firm, reading as follows:—"Put a cube of beef bouillon into a cup of hot water and you are pro-

tected against catching cold," or "A cube of beef bouillon in hot water for the kiddie, mother and grandmother, wholesome, stimulating and nourishing." This condition of feeding is not in harmony with physiology. Nature abhors anything that is not in harmony with its laws, anything that is not physiological. Something had to change—either the diet or the intestines. There is nothing much to do now for the muscular coating of the intestines. From this non-use, atony and atrophy have resulted. This atony and atrophy of the intestines make them easy prey for surrounding tissue, which, through the modern unphysiological methods of living are prone to be in an inflammatory state.

Those intestinal loops through their conditions of stasis fall into, and are received into fossae. Gerster's theory explains the rest. There is a colitis, by contact this inflammation spreads, adhesions take place and you have all sorts of conditions. Dr. Royster of Raleigh, said: "We have the Jackson veil, the Lane kink, sigmoid adhesions and 'cobwebs in the attic.'" This last named condition plays a most important part in the real pathology of the intestinal lesions.

My dictum as to therapeutics is "Never trouble trouble till trouble troubles you." But if you must trouble it, then do it as near as possible in a manner best calculated to restore the physiology of the parts. The mere freeing and refastening in other places of an intestinal loop or kink is but a temporary expedient at best. The same causes that originally produced the conditions are still operative. If you "short circuit" a loop what will prevent the necessity in the future from making a "short circuit" higher up? From personal experience I am well within the limits of safety when I say that less than one-quarter of such

patients require any surgical intervention at all. If patients who have been sufferers from chronic constipation or colitis are put upon a suitable diet with proper internal treatment, seventy-five percent recover physiologically in from 6 months to one year. The common error made is to change the diet from a concentrated one to a bulky one too suddenly. This means increased peristalsis in an intestine physiologically unfit to perform that function. The result is pain, more stasis, ptosis, fermentation and greater toxemia.

Dr. Harris, Chicago, demonstrated that the pain is the result of traction on the mesentery and its attachments. "We can reproduce the same characteristic, general diffuse pains of which these patients complain, not by touching the pericolic membrane itself, because that is insensible, not by manipulation or making traction on the colon, which is likewise insensible, but by making traction of the membrane itself, where it is attached to the parietal wall."

No matter where or how the new attachment is made, sooner or later the same unphysiological condition will again manifest itself. Time and again the statement is made that the symptoms of toxemia are due to the fact that the intestinal stasis allows the contents to remain too long in transit. Is this not mere guess work, how does anyone know that this is the fact, unless a test has been made to determine it?

**Testing the Speed.**—Immediately after any given meal allow the patient to swallow six 5-grain tablets of charcoal. The patient must be instructed to take the usual meals, the usual exercise, in fact conduct himself in every respect as heretofore. Attend to each call of nature in the accustomed manner and watch for the first appearance of the black charcoal stool and note the time elapsed since the taking. If

this is less than six hours, the contents are hurried through the canal too rapidly, if more than twenty-four hours too slowly. If the charcoal stool appears within 48 hours there is no indication for operative interference. If 72 hours elapse and the *clinical symptoms warrant* it, a future operation may be borne in mind. I have patients who made a perfectly physiological recovery where the charcoal did not reappear in 96 hours and did not entirely leave the system for a week or more. Operation is only indicated when all other means have been thoroughly tried and the clinical symptoms demand it.

In a very able editorial of the *Journal of the A. M. A.*, Dec. 6, 1913, headed "Alimentary toxemia—intestinal auto intoxication," we find the following well chosen closing remarks:

"When these cases are reported we are always assured that all medical means had been adopted without benefit, but we are never told what the medical means were. A suspicion comes to one's mind sometimes that perhaps some surgeons do not know all the means the physician has at his command for the treatment of delayed action of the bowels." It certainly is very gratifying to note that the *Journal of the A. M. A.* recognizes that there are possibly other measures than always and forever surgical ones. It frequently happens that while the surgeon is doing his best he overlooks the physiology involved in the case. Dr. Alex Nicoll recently reported to the Bronx Medical Association two operations performed by him in cases of bichlorid poisoning. Case No. 1 had taken 30 grains of bichlorid some few hours before coming to Fordham Hospital. The stomach was washed but with little results. Dr. Nicoll then thought that if the kidney could be kept functioning the patient might be

saved. Both kidneys were exposed and a stream of hot water played upon them for several days. The kidney never functioned and the patient died at the end of a few days. A second case appeared and the doctor again operated. This patient had taken about 30 grains of mercury, but dissolved, and was not seen for twenty-four hours after taking it. A very much graver prognosis than in the preceding case. This time he fastened the catheters into the pelvis of each kidney. The doctor says that he was amazed at the enormous absorptive power of the surrounding tissue; he passed into the patient 500 ounces of normal saline solution and recovered only 200 ounces by the way of the bladder during that time. Later the bladder again filled and from that time the patient voided her urine regularly and made an uneventful recovery. Was it the surgical operation on the kidney that saved the patient's life or was it the absorption of the physiological salt solution, which could have been introduced into the patient's system by her family physician in her own house at once after taking the poison?

Mercuric bichlorid may be taken in tablet form 1-20 of a grain several times daily by one unaccustomed to it. Of a  $\frac{1}{2}$  of one percent solution 40-60 minimis may be used daily without harm for several years. If this patient absorbed into her circulation a solution containing 30 grains and shortly thereafter received as fast as her circulatory system would absorb it 300 ounces of water, she then had 30 grains in 300 and more of water or a solution strength of  $\frac{1}{50}$  of one percent.  $\frac{1}{10}$  of one percent being a usual and harmless dose in the circulation, it was then simply a question of an amount in one dose, but five times as weak as the ordinary therapeutic dose. It is highly possible that a patient in otherwise

good health as far as the kidney functions are concerned, may be able to handle such a large dose without serious consequences. Ehrlich says "Mercury and arsenic are both metals highly poisonous to living protoplasm. *But their salts will cease to be poisonous however much mercury or arsenic they may contain; unless they have unsatisfied chemical affinities that enable them to combine with the living protoplasm, and so get to work on that.*" There is no doubt that some damage is done to the kidney tissue, but it may be under such circumstances within the range of physiology to temporarily withstand it.

**Physiological Treatment.**—Having become satisfied that the clinical symptoms are the result of retention, yet not urgent enough for operative interference, we administer at least three tablespoonfuls of liquid petrolatum with about 5 drops of Ol. aurantii to each dose. This procedure must be maintained for at least one week. At the end of this week add to this treatment the bacillus Bulgaricus (liquid) in rather large doses three times daily, if possible, on an empty stomach.

The reason for this treatment is purely physiological. If the pathology is correct we have a gut inflamed, adherent and lessened in calibre. A mineral oil therefore acts as a mechanical lubricant and does nothing else. The orange oil reflexly causes a contraction of all the viscera. Whenever we are dealing with stasis, especially in the lower third of the small intestines we have an abundance of bacilli causing putrefaction which must have an alkaline medium for their propagation. The bacillus Bulgaricus forms from the intestinal contents an acid medium. The putrefaction forming bacilli disappear and with it of course fermentation and decomposition. The gas no longer forming and

distending the gut, there is no more absorption of the toxic material, and the parts have been restored to a physiological equilibrium. The pain ceases, because there is no longer any traction exerted upon the intestinal attachments. We saw that was the real cause of the pain. It must not be imagined that all this can be accomplished with the same rapidity that temporary relief can be gained from a surgical intervention, but if relief is gained in this manner, it is apt to be much more permanent and it leaves the patient physiologically unmutilated.

I shall append but three cases falling into the category of intestinal stasis with more or less copremia. These cases are selected because they show the age range from 11 years to 73, or from one not yet in her teens to a great-grandmother.

*Case I.* Miss S., eleven years of age. From the time that she was 2 weeks old has been obliged to resort to rectal injections once every day. Patient for years has complained of abdominal pains, no food would agree excepting small amounts of meats, everything caused pain a few hours after eating. This child became very irritable and could not attend school with any regularity. Her complexion was of that light brown coffee-stain type, which in an elderly person would indicate cachexia.

Examination showed liver insufficiency plus inflammatory lesions in the ileum. Charcoal test appeared after 72 hours with the assistance of rectal enemata. This little patient was put upon liquid petrolatum, for the purpose of overcoming the pain consequent upon the passage of dry fecal matter through an inflamed ileum. *Bacillus Bulgaricus* for the purpose of stopping the fermentations and the consequent toxemia, the galvanic sinusoidal current to overcome the liver insufficiency.

*Results:* All pain ceased during the first week, patient attends school regularly, complexion has so changed that words do not suffice to express it, is a cheerful and happy companion to her playmates, in

fact is perfectly well in six weeks, after eleven years' suffering.

*Case II.* Mrs D., 48 years, referred by Dr. Sherman, on Nov. 25, 1912. Patient has suffered for a long time from constipation, bowels were compelled to move every day by enemata, pains all over abdomen, especially marked in region of ileocecal valve. Entire abdomen is hard, intestines distended, diaphragm pressed upward, embarrassing respiration and circulation, severe headaches and always a bad taste in the mouth. No desire for food. Patient objected to an operation which was strongly urged. Charcoal test showed primary delay of 92 hours; the last trace passing out of the system eight days after taking. Electric examination showed atony of the large bowel.

*Treatment:* Gradual regulation of the diet, the sinusoidal current for the restoration of normal peristaltic power of the large bowel, double doses of *bacillus Bulgaricus* three times daily. The electric treatment was carried on every other day for 2 months, then twice and finally once per week until March, 1913. Patient feels perfectly well, lost 12 lbs. in weight and a reduction of waist measure of 5 inches. The loss of weight was the result of abstracting fat and water from the body, the decrease in waist measure is the result of intestinal contraction.

*Case III.* Mrs. T., age 72 years, referred March, 1913, by Dr. L. Weiss. For the past few years has been a sufferer from some obscure intestinal trouble, the result of chronic constipation. Operation was rejected by patient as well as Dr. Weiss on account of age. Several times each week was obliged to resort to morphine injections on account of pain. In March the patient's weight was 219 lbs. Examination showed involvement of the large intestine, marked distention and atony with stasis and constipation. This patient has an aversion to any and all kinds of oil. *Bacillus Bulgaricus* was administered to prevent the fermentation and gaseous distention. The high frequency current by the diathermic method was applied daily for the purpose of increasing the circulation in the intestinal area with the prospect of absorbing adhesions. In

July patient went to the seaside, had a fairly comfortable summer, returned for continuation of previous treatment bi-weekly in December. At present time feels fairly well, suffers little pain, takes no cathartics, a proper diet is all sufficient, weight, 198 lbs.

While I do not deprecate surgery or its wonderful accomplishments—on the contrary we can never bow too low to her godess—yet too much of a good thing is good for nothing and so with surgery; it should not be exploited to the exclusion of all else. There are other therapeutic measures that are capable of restoring to an almost normal physiology.

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#### MEDICAL HINTS.

Non-venereal warts are often serrated or digitated and they are confined to the epidermis only. It is important to remember that they may develop on the top of a real syphilitic condyloma.—*Am. Journal of Dermatology*.

Be suspicious of carcinoma when you obtain the following history in a patient over thirty-five: Diarrhea for the past months, preceded by a short period of constipation. The diarrhea at first is limited to the day; later the patient awakens at night with an intense desire to empty the bowels. He rushes to stool only to find that he is unable to pass anything but a little blood. This recurs four or five times each night and more frequently during the day. Loss in weight may be only slight.—Wagner in *Int. Jour. of Surgery*.

## THE ANNOTATOR

#### Overcrowding in Tubercular Families.

—The dreadful overcrowding in tubercular families of the submerged tenth is brought out incidentally in an article by Maurice Fishberg in the *Archives of Pediatrics* (Feb., 1914). He investigated 217 families consisting of 1,369 persons of whom 1,129 lived at "home" in 717 rooms and slept in 658 beds. That is, about two to a bed and 1.57 people

to a room including kitchens. Of the 274 tuberculous persons only 112 had separate rooms and only 136 had separate beds. Some consumptive mothers slept on chairs or on the kitchen floor. Fishberg says that this state of affairs is usual in all industrial centers here, and European investigators say it is the same there. No wonder the children are all infected and many a one gets big doses of virulent bacilli before it has had time to develop immunity. Schlossmann is quoted as saying that the mere fact of a child living in a household with an "open" tubercular case, is equivalent to a diagnosis. Country children in non-tubercular families do not become infected for many years—depending upon their chances of encountering bacilli when visiting town or neighbors. The adults in these overcrowded houses are of course in the gravest danger, not of a new infection, but of so deteriorating in health that their old lesions spread. Add to this the under nutrition and the wonder grows that any are left alive. The pity of it all is the fact that sufficient houses or rooms cannot be built for the world's population. The least efficient always have huddled into what shelter they could get and probably always will. The bad conditions can be improved of course, but not eliminated as long as every fool thinks he has a right to create as many babies as he pleases—to be victims of overcrowding, undernutrition and tuberculosis. It is reported that in the Vanderbilt Model Tenement, 77 and East River, N. Y. City, no new cases of tuberculosis have arisen, thus showing that

mere living in a tuberculous family is not harmful if the house is proper and food sufficient. The babies are infected no doubt but are able to resist the spread of the bacilli if properly fed. Unfortunately there is neither money nor room to build model tenements for all, and even if we did, the short sighted occupants would soon fill them with babies and restore the old overcrowding.

#### The Cause of Pellagra.—



Sambon's infectious theory of pellagra has been adopted by the members of the Thompson-McFadden Commission of the New York Post Graduate School, who have been investigating the disease in Spartanburg County, S. C. They cannot find any sure evidence that Indian corn or maize, good or bad has any causative relation to the disease whatever. They are of the opinion that, in this country at least, the only blood-sucking insect which might be accused of being the carrier is the stable fly (*stomoxyx calcitrans*). They seem to have dismissed the simuliun, buffalo gnat, or black fly, because the sufferers here are townsmen, to a large extent rather than country men as in Europe, but the simuliun which is found solely along water courses in Europe, very often invades the towns here. Sambon has found so much evidence implicating the simuliun that it is not wise to dismiss the indictment without sure proof that it is erroneous. This the commission has failed to do. Indeed they have added nothing to our knowledge of the real cause, nor how it gains an entrance to the body. This is somewhat disappointing, but it is the rule in all medical research commissions and committees. Discoveries are made by individuals after long search and faithful study—and mostly by an inspiration to correlate facts in which other observers can see no relation whatever. Committees are invaluable when they gather facts, but too often they cannot see the woods for the trees.

#### The Menace of the Manicure.—

The manicures should now be regulated in the

same way the health authorities had to get after the barbers. At the recent meeting of the New York State Medical Society attention was directed to the numerous cases of felons which have been traced to these women, who as a class have become very reckless in cutting away



the natural protective coverings of the nail edges. Pus organisms may be inoculated from the upper layers of the skin even if the instruments are sterile. We cannot see the need of manicures anyhow, but they have become something of a luxurious fad which thousands consider among the necessities of the dainty life. It seems therefore that they must be taught how to keep their instruments sterile and how to avoid injuring the tissues or exposing the lymph spaces where bacteria can flourish. How to accomplish this, we do not know, and we must leave it to the Board of Health as we do with all the rest of our sanitary troubles and worries. In the meantime let us trim our own nails, and if we cut ourselves we introduce our own pus organisms to which we have at least some immunity, and do not get those derived from someone else against which we may have no defense whatever. We may expect to hear of some cases of septicemia now that the matter has been brought to public attention.

#### Shall We Tell the Sick the Truth?—

We thought that this question had been answered in the affirmative long ago, but there seems to be a lingering doubt in the minds of a few, who assert that the shock of knowing of early death sometimes hastens the downward course and is unnecessarily painful. We are not at all sure that a proper presentation of the facts ever has such deplorable results, but we are very sure that death is frequently hastened by improper ways of living which would be abandoned if the truth were known. Correct therapy is impossible without the cooperation of the patient, and he will not cooperate unless he knows the rea-



sons. The exact state of affairs can be explained without being an alarmist and without causing pain. Indeed there are plenty of instances in the experience of every practitioner in which the patient has calmed down upon finding out the real state of affairs, and has thus reacted better to the treatment. To be sure, a delirious patient cannot understand his situation and no one attempts to explain it. He is literally in the hands of his friends, but where he is still something of a free agent he must know the facts. Where property is to be devised and the welfare of others guarded, it would be a crime to hide the truth. There are not a few physicians who have said that there is no condition which warrants keeping the patient in ignorance of it. Men don't die when they learn they have heart disease, but they live longer by living better. This whole discussion is periodically raised by a few hypersensitive laymen who imagine things which do not exist. We are quite sure that the agonizing horror said to be the result of learning of a fatal affection is rarely if ever encountered. People accept the inevitable. In the long run, truth is infinitely better than falsehood. Suppression of facts always reacts against us.

#### Has the Anti-tuberculosis Crusade Increased the Death-rate? That inference has been drawn by Dr. Thomas J. Mays of

Philadelphia, Pa., from a study of the statistics published by Mr. Frederick L. Hoffman (*Medical Record*, Apr. 25, 1914). We have called attention to the fact that the anti-tuberculosis workers are in error in claiming the credit for the

reduction in the consumption death rate, because this reduction began long before their work. It seems proved that all people have tubercular lesions, but fewer and fewer have the process activated by the infections and bad hygienic habits. That is, the crusade for better hygiene and sanitation has kept many from becoming victims of consumption. Dr. Mays says that the anti-tuberculosis crusade has really hampered this normal movement, because the reduction in the last fifteen years is less everywhere than in the



previous fifteen. We are afraid that he has been deceived by the figures. One must always keep in mind Walter Bagehot's three degrees of deception—lies, damned lies and statistics. In this case, the death rate curve follows the usual paraboloid or hyperboloid of every other similar phenomenon. At first, a little sanitary improvement about 1880, caused a big decrease of deaths, but as we approach the irreducible minimum this yearly reduction is less and less, and the curve gradually approaches a horizontal straight line. Let us hope that it will never become a horizontal line, but that there will always be a yearly improvement, though there is no hope at present of reducing the death rate to zero this side of the infinitely remote millennium, as the elimination of tuberculosis has been proved impossible.

**The Best Time for Work.**—This is a question that is receiving considerable attention in Germany, and the curious con-

clusion is reached that fatigue gives the emotions and imagination full play so that novelists do better at night when not hampered by the repressions of their intellect! Perhaps this explains some silly novels.

It is agreed that we can commit to memory, or do mathematics best in the early morning and that a fatigued brain cannot remember. It has again been proved that night work of school children is not only useless but an actual harm from the exhaustive stimulation necessary to make the brain work at all. Evening is story time, for then our thoughts run riot, and tired children love the marvellous though they see the inconsistencies when they are fresh in the morning. It is true that there are few philosophers at the breakfast table nowadays, but that is because few get enough sleep and are semi-somnolent for an hour or two. It is also true that dinner conversation is the most brilliant but that is because our inhibitions are weak. It does not seem even good the next day when we soberly go over what we can remember. So we cannot understand why anyone can advocate working in the period of fatigue. Some men work well late

at night but they sleep late at day, and they would do better if fresh. Many a writer tears up what he writes at night, for he sees its worthlessness in the morning. It can be accepted as an axiom, that for all kinds of work, either muscular or mental, the most and best can be done after a good night's sleep, and that the product deteriorates until fatigue makes it worthless in 4 or 5 hours. After a rest, it again mounts in quality and quantity, but deteriorates more quickly than in the morning. Night is the time for mental and physical rest, if the day is occupied.

**The Vanishing Long Hat Pin.**—Happily this is one of the blessings conferred on male humanity by the change in feminine fashions.



We do not pretend to understand the mechanics and physics of the matter, but we are credibly informed that the small concealed anchorage is more effective than the rapiers which were once considered both necessary

and in good taste. What the police of the old world found impossible to remedy, has been accomplished by fashion and scarcely a man has heard of it. Some months ago we timidly but joyously suggested that as we had heard there was to be a change in styles, we would soon be freed of the daily risk of having an eye poked out or a cheek plowed up. We are now bold enough to assert that public opinion does have some effect on fashion after all. The pocketbook is very sensitive to changes in demand, and the Parisian inventors of styles are evidently afraid to make up things which will not sell. They heard the demand for less immodesty of one kind of gown, though to be sure they supplied it in another form, which likewise is sure to early abandonment. There was a longing for hats which did not require pins dangerous to husbands and fathers and which would meet with less objection. The longings have been supplied. There may not be a word of truth in all this, but we say it because it flatters our vanity to think we may have some influence on feminine styles which affect public health. We hope

no cruel correspondent will shatter our fond delusion with any miserable facts.

**The Question of Exercise.**—Health requires very little exercise, far less than people generally imagine.

Professional acrobats exercise their stunts only a few minutes a day, rarely more than fifteen. They find that more exhausts them and makes their work dangerous. They live to a good old age if they escape accident and so

do clergymen, but the heavy workers like stevedores and porters die prematurely. A number of men of stocky build, notably Theodore Roosevelt, have created the impression that exercise has been the cause and not the result of their physique. There is no question that muscles will enlarge somewhat under training, and the bones adjust themselves to the strain, but a man's physique is what he gets from his ancestors as modified by his early feeding and environment. Our pedagogues once tried to argue that education increased the intelligence and brain weight, and probably convinced the unthinking. The schools are now wasting money trying to make silk purses out of sow's ears. The physical culture specialists have gone to similar extremes, and are also teaching that we need far more exercise than is good for us. The Army had so many deaths charged to the annual test rides that officers over sixty are now excused, but the increasing number of deaths from heart failure of those under sixty, supports the contentions of the physiologists that the human heart over 45 or even over 40, must not be abused. Athletes generally quit before 35, most of them before 30, because the heart cannot stand it. Even golf, the ideal sport for the mature and aged, can be fatal to a weak heart in the effort of making a long drive. We had to stop the bicycle mania some years ago, because so many men over 40 dropped dead from acute dilatation, and we must now warn them against all strains. The steps of elevated roads or subways are said to kill a large number every year in New York City. People over forty had better walk up—never run.



**Excessive Exertion After Fifty.**—The dangers of excessive exertion after middle age are again in evidence from the death in the Philippines of Major Amos B. Shattuck of the Army, Dec. 22 last. According to the *Army and Navy Register*, May 2, 1914, "apparently he was in splendid health. Being a natural athlete and very fond of outdoor exercise,



he kept himself in fine physical condition. Every morning early before going to his office he rode ten miles on horseback. In the late afternoons he played golf or tennis, frequently both. Neither he nor anyone else had the remotest idea he had heart disease. There was not the slightest warning.

"The morning of his death he arose in fine spirits, happily anticipating the return of his family for Christmas. With his mounted orderly behind him he rode through the post, stopping in his pleasant way to laugh and joke with various officers and accepting an informal dinner invitation from the post surgeon and his wife. Five minutes later, when near the corral, he suddenly collapsed as if he had been shot, fell forward on his horse's neck. The autopsy revealed direct sclerosis of the coronary arteries of the heart—athlete's heart. None of the injuries received from the fall were sufficient to have caused death. His faithfulness to exercise killed him."

Instead of keeping himself "in fine physical condition" and ready for war, he was doing the opposite.

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**A Regrettable Veto.**—Medical research is hampered in New Jersey by Governor Fielder's veto of the bill which authorized

the Rockefeller Institute to establish a branch in that state wherein some of their wonderful work could be continued to better advantage. This action was the direct result of the noise made by a small number of antivivisectionists, which

evidently deceived the governor as to public opinion. Of course the great majority of the people are as ignorant of the matter



as the governor has shown himself to be, but there is no question that if the facts were known the vast majority of the people having sense enough to have any opinion at all, would demand an institution for the study of the diseases which could be prevented but which are now slaughtering their thousands and tens of thousands. The anti-vivisectionists have now reached a point where they must be suppressed as public enemies. The first step is to prosecute them for criminal libel when they deliberately make false charges of atrocious conduct. We are much afraid that Doctor Flexner's failure to convince the governor is a direct outcome of the failure to act against those who have so viciously libeled the Institute. Denial of false charges does no good. The last victim is Dr. L. Emmett Holt, who has been charged with giving infections to babies for experimental purposes, because he had used tuberculin for diagnosis in a harmless way. We hope that he will consider it a solemn duty to civilization to sue these scoundrels for heavy damages, and we also hope that the District Attorney will take up the criminal prosecution of people who are doing infinitely more harm than the gunmen.

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**Pancreatitis.**—Ochsner says (*Jour. A. M. A.*) that a clinical diagnosis of chronic pancreatitis is usually possible before operation. This condition is practically always a complication of gallbladder or gallduct disease, except when following metastatic infection. It is usually curable by relieving the pathological condition of the gallbladder and ducts. An operative diagnosis of acute pancreatitis can often be made. Early operation greatly improves the prognosis. It is important to reduce to a minimum the trauma in these cases. The important factor in the treatment consists in the establishment of free drainage.

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**Miscarriage.**—Potassium chlorate is efficacious in endometritis. It will also stop uterine hemorrhage and reduce the size of a subinvolved uterus. In habitual miscarriage, this drug, given in 5 grain doses three times daily and continued throughout pregnancy will produce no untoward effects and be followed by normal labor.



## The Importance of Post-Graduate Study.

To the Editors

AMERICAN MEDICINE:

I notice in the March issue of AMERICAN MEDICINE an editorial "The Need of More Post-Graduate Study." I think this is very timely, or post-timely, as this matter should have been agitated and dwelt upon more in the past than it has.

Before I moved into the country to practice I was in the habit of going to New York City every year or every two years and spending as much time as I possibly could in the dispensaries and clinics in order to keep abreast of the rapid advance of medical progress. This I think stimulated the desire to go abroad. This I did and have never regretted the time and money it cost me.

I feel now that I am getting in a way to be a back number, as my time for reading does not give me what I feel I need and is not satisfying. While in the great majority of cases our knowledge and experience are sufficient for the occasion, still we are occasionally brought up standing against some condition which is out of the ordinary routine of our practice and our technique in diagnosis is insufficient to grapple with the case; whereas if we have recently spent some time in post-graduate schools, clinics and dispensaries, we may have derived a lot of information concerning diagnostic technique which will be of great value to us. My views may be rather radical but I believe that for medical men, dealing as they do, not only with the lives and health of the people, but with their happiness—for there can be no happiness without health—there should be a law requiring every practitioner to spend six weeks to three months in post-graduate study every two years, pass an examination at the end of this term and receive a certificate therefor. This could be taken as a vacation, for there are so many interesting places where men could go to take this course that it would not become monotonous.

In speaking of vacations, I will venture to say that fifty per cent. of the country practi-

tioners of medicine throughout the country do not take three months vacation once in ten years. What are the consequences? They become grouchy, arbitrary, bigoted and narrow in their views of life, they get into a rut, and travel along without getting one-half of the pleasure out of life they should and develop only 50 per cent. efficiency. An old practitioner with his years of experience, if he has kept abreast of the scientific progress of his profession, should be like old wine—the older the better.

Respectfully yours,

L. J. MCADAM, M. D.

## Limiting the Offspring of the Poor.

To the Editors

AMERICAN MEDICINE:

In the April issue of AMERICAN MEDICINE, in the department of The Annotator, I come across the following sentence: "Instead of calling for help to raise infants who are destined to be as worthless as their parents, why not popularize ways of avoiding pregnancies?" And I felt like thanking the Lord and exclaiming: "Eppur si muove!"

For many years the undersigned was the sole voice in defence of the artificial limitation of offspring, particularly among the poor, and it seemed to be a voice in the wilderness. The orthodox were shocked and the mediocrities shrugged their shoulders. But now some thoroughly respectable journals are beginning to take up the subject. Some are still doing it in a hesitating, somewhat apologetic manner, but it will not be long before the subject will form the theme of their foremost editorials. Yes, the world does move.

With continued good wishes and congratulations on the constant improvement in AMERICAN MEDICINE.

Sincerely yours,

WILLIAM J. ROBINSON, M. D.



**The New York City Typhoid Epidemic of 1913.** The Central Council of Public Health of the City of New York made an investigation of the typhoids of 1913, with a view of aiding the Department of Health in its crusade against this disease. Their report (*N. Y. Med. Jour.*, Jan. 10, 1914) confirmed the conclusions already published to the effect that most of the cases were contracted from infected foods mostly milk, and a small number from close contact with the sick as in the case of a mother nursing a son. Incidentally they say that only one-third of the cases in the country as a whole are water borne. Their conclusions and recommendations are so important to all the country that we quote them in full:

#### Summary.

1. Typhoid fever is acquired by drinking and eating food contaminated by the excreta of typhoid patients. Water, milk, vegetables, oysters and shellfish, are the chief articles of food by means of which typhoid fever germs are carried into the stomach.

2. The comparison of the typhoid death rates of 2.5 per 100,000 population in Hamburg, 3.6 in Berlin, 4.0 in London, 4.1 in Vienna, and 6.7 in Paris with the typhoid death rates of 11.6 in New York, 11.6 in Boston, 13.7 in Chicago, 17.4 in Philadelphia, and 23.2 in Washington, D. C., strikingly indicates how much more there remains to be done along the lines of prevention of this disease in this country.

3. A large percentage of typhoid outbreaks is milk borne and preventable. The recent serious outbreak in Manhattan (Autumn, 1913) had its origin in contaminated milk. This fact again emphasizes the need for efficient pasteurization of all raw and certified milk.

4. The Department of Health of the City of New York is not equipped financially to control efficiently the production and distribution of the milk sold in this city.

5. The Department of Health has used its present small force of typhoid inspectors to good advantage.

6. A large proportion of cases of typhoid in this city seems to have originated through careless contact with typhoid patients. This is probably the result of:

A. The incomplete reporting of typhoid cases by physicians and hospitals and the consequent insufficient exercise of control by the Department of Health.

B. The apparent lack of appreciation on the part of physicians and the public of the contagiousness of the disease; and

C. The inadequacy of the educational methods of the Department of Health concerning sanitary precautions, food preparation and disposal of excreta, and the lack of follow up visits by health department inspectors to ascertain whether instructions given have been carried out.

#### Recommendations.

The Central Council of Public Health of the City of New York recommends:

1. That the Department of Health take more rigorous action in enforcing the law concerning the reporting of typhoid fever cases.

2. That the attention of the boards of managers of hospitals be called to the fact that hospitals frequently fail to report cases of typhoid fever and that an appeal be made to them for prompt and complete reporting of all such cases.

3. That the Department of Health require the hospitals to enter cases of typhoid fever in the special books provided by the department of health for the registration of cases of tuberculous and venereal diseases.

4. That the Department of Health be urged to enforce rigorously its rules and regulations with respect to sterilization of milk cans and milk bottles.

5. That the health department's force of inspectors, both for typhoid and milk inspection, be increased and that the medical and sanitary corps of the department be made more flexible; and that in the case of milk supervision special attention be paid to the inspection of the milk at the receiving stations.

6. That the Department of Health be requested to institute supplementary visits in typhoid cases and to require from its inspectors reports on the continued observance of sanitary rules in the homes of the patients.

7. That the Department of Health exert its influence in the matter of early sending to hospitals those cases of typhoid fever in which the department's inspectors report inadequate sanitary care.

8. That the Department of Health consider the revision of its circulars of instruction with the view of making them still more helpful to the public.

9. That the county medical societies of this city be asked to stimulate interest among their members as to the importance and necessity of prompt reporting of typhoid fever cases and of adequate isolation and disinfection.

10. That greater use be made by physicians of the facilities of the Henry Street Settlement in securing adequate disinfection and proper isolation in cases of typhoid; and

11. That the attention of the public be called to the resolution adopted by the New York Academy of Medicine urging that all persons in an infected family and any person who has been exposed in any way to the disease follow up the sanitary precautions usually taken in such cases, subjecting themselves to immunization at the hands either of their private physician or of the Department of Health.

**Incidence and Diagnostic Value of Blood or Hemorrhage in Gastric and Intestinal Lesions.** Dr. Geo. B. Eusterman (*St. Paul Medical Journal*, Dec., 1913) of the Mayo clinic presents a statistical study of examinations of stomach contents or stools for blood with the following results:

Repeated hemorrhage in the presence of a preceding history of gastric disturbances with pain or distress signifies an ulcer of the duodenum or stomach in more than 90 per cent of the cases.

Examination of the gastric contents and meat-free stool for occult blood is of undisputed value in the differential diagnosis of doubtful cases and in estimating the effectiveness and duration of dietetic and medicinal treatment. However, positive occult blood findings, unless taken in conjunction with the clinical symptoms and physical findings, may lead to wrong conclusions.

In 568 proven cases of duodenal ulcer single or repeated hemorrhage, by mouth or bowel or both, occurred in 19½ per cent; in 249 cases of gastric ulcer in 23 per cent. In disease of the gall bladder gross bleeding in variable amount occurred in 2 to 4 per cent; in chronic and subacute appendicitis in 1 to 2 per cent.

Positive occult or altered blood findings in order of frequency are incident to gastric cancer, chronic simple ulcer of the duodenum and stomach, disease of the gall bladder and appendix. Altered blood was present in the gastric extracts in 75 per cent of 688 cases of gastric cancer, in 17 per cent of 497 gastric analyses, in 568 cases of duodenal ulcer, and in a general average of 28 per cent in 343 cases of gastric ulcer. In 228 analyses of 500 gall bladder cases positive occult blood reactions were obtained in 43 per cent or in 19.6 per cent of the total (Tr. Guaiac or benzidin tests). In 110 analyses of 500 cases of appendicitis a positive reaction with similar reagents was present in 24 per cent or in 5.4 per cent of the total.

6. A single dose of pituitrin may be used as an adjuvant in cases where pregnancy is interrupted, either by catheter or bag, and only when contractions of the uterus have already set in.

7. It should be used only in cases in which the cervix is dilated or dilatable and the presenting part engaged in the pelvic outlet.

8. It should be used cautiously in cases in which the fetal heart sounds are feeble or irregular.

9. It should never be used unless a general anesthetic is within easy reach, for the contractions may become so violent that rupture of the uterus becomes imminent.

Finally, the conclusions reached in this paper are based purely on our personal observations of the action of this drug in a very large series of cases. We feel that it may not be in accord with the experience of many other observers, still we maintain that in order to obviate many complications, which at times may become very dangerous, this drug should be used conservatively.

We appreciate its value when properly used; we realize its dangers when given injudiciously, and we cannot but advise the general practitioner to be conservative in its use.

**The Management of Diphtheria.**—In an unusually concise but complete discussion of the treatment of diphtheria Dr. A. W. Jones (*New York Med. Jour.*, May 2, 1914) says that as in other contagious diseases the patient should be isolated in a large airy room, which is stripped of all unnecessary furniture, carpets, rugs, hangings, books, toys, etc. The room must be free from draught, so arranged that proper ventilation can be carried out, and kept at a temperature of 70° F. Fresh air in the treatment of this disease is of great importance. Everything used by the patient or with which he comes in contact should be reserved for him alone. Instruments, tongue depressors, spoons, dishes, bed linen and clothing should be boiled or placed in a five per cent carbolic solution.

Antitoxin serum is indicated in all cases of diphtheria, and the dose should depend upon the severity of the disease and not upon the age of the patient. It has been my experience in treating over four hundred cases of diphtheria that children require just as large, or even larger doses than adults for these reasons: Their mucous membrane is softer, they are more susceptible to the disease, and have less power of resistance. No time should be lost in administering the antitoxin and the dose should be larger than it has been the custom to use, and if possible, should be given in a single dose. The injection should be made where the skin is loose, and for that reason I generally select a place between the shoulder blades.

In all cases of diphtheria stimulants are indicated from the onset. It is a mistake to wait for signs of debility before using alcohol in this disease. Strychnine, digitalis, and caffeine are used also with benefit.

The nose and throat should be kept clean. This is best accomplished by using an anti-



## TREATMENT

**Pituitrin in Obstetrics.**—In a valuable contribution to the subject A. J. Rongy and S. S. Arluck (*New York Med. Jour.*, May 2, 1914), give the following conclusions:

1. Pituitrin does not induce labor pains.
2. It should not be used in the early part of the first stage of labor, for its action is too transient.
3. It should not be used in complete inertia because of danger of rupture of the uterus.
4. It is contraindicated in cases of dystocia due to malposition or contracted pelvis.
5. It should never be used in cases in which a sudden rise of blood pressure may prove dangerous.

septic gargle and a nasal spray. For the gargle, I generally use a thirty per cent. solution of peroxide of hydrogen and for the nasal spray, a weak Seiler's solution, every two hours. If the nasal passage becomes irritated a little zinc oxide ointment applied three or four times a day affords great relief. A slight nasal hemorrhage may necessitate less frequent syringing and a free hemorrhage would stop the use of the syringe entirely. In all cases the bowels should be kept regular by the use of laxatives, and the condition of the kidneys carefully watched throughout the disease. If the kidneys are found to be secreting a small amount of urine, an active diuretic would be indicated.

For the fever the best antipyretic measure consists in sponging with evaporating lotions, such as alcohol and water; the cold pack and colonic irrigation are very serviceable in some cases. High fever due to pneumonia or any other complication should be treated independently of diphtheria.

Careful feeding forms an essential part of the treatment; the diet should be light and consist of articles that will not disturb digestion. Milk, broths, beef juice, albumin water, custards, cereals, etc., every two or three hours is indispensable. As the symptoms subside soft boiled eggs and milk toast may be added to the diet. When it is difficult to feed by the mouth owing to excessive vomiting or other causes, it is a good plan to let the stomach have absolute rest and to depend on rectal feeding for a short time.

**Sprains of the Knee Joint.**—Cheatte (*The Practitioner*, London, March, 1914) in discussing sprains and strains of the knee joint says that if there is a dislocated semilunar cartilage, the treatment depends upon, 1, whether it is of recent origin and has happened for the first time; 2, whether it has happened twice or many times; 3, whether the patient's occupation would lead him into situations in which a loose cartilage could cause a serious accident. When no such condition is present, and the case is an acute one, in which a severe sprain has occurred for the first time, and in which no rupture of the ligamentum patellæ has occurred, the limb must be rested for about twenty-four hours—not necessarily in a splint—a thick layer of cotton and a bandage is often sufficient. If seen within the first five minutes, cold, applied by means of ice, might arrest the hemorrhage. After the first half hour, it is best to apply large, hot, and frequent fomentations. At the end of twenty-four hours, gentle massage may be given the thigh muscles, and the articulation, and passive movements can be begun. In performing passive movements it is essential that the patient should help the surgeon in every movement. The patient's muscles will then be acting with, and not against the surgeon, and there will be no fear of excessive movement. In a very severe sprain this treat-

ment should be continued for three or four days, when the patient can begin to walk. At the end of a week massage of the muscles and joint can be continued, and he should perform regular muscular exercises. The usual history of chronic sprains is, that after the accident, the limb is kept too long at rest with or without splints.

**The Serum Treatment of Epidemic Cerebro-Spinal Meningitis.** Dr. Harry A. Ong (*Archives of Pediatrics*, Oct., 1913) has given an excellent resume of the information to date as to the results of Flexner's serum. He says:

The average mortality was reduced from approximately 70 per cent to about 30 per cent; the course of the infection shortened; symptoms were lessened in severity; recovery hastened; and sequelae prevented in a large percentage of cases.

Continued use of the serum since its introduction has substantiated these early reports. The serum greatly improves the mental condition, consciousness is cleared and patients often return from a comatose or delirious condition to a rational mental state within a few hours. Headaches are less distressing, and pain in the back and neck is greatly relieved. In the majority of cases there is a gradual amelioration of symptoms with the decline of the temperature by lysis. In about 30 per cent of cases, however (mostly those in which the serum has been given early), the termination is by crisis—a sudden cessation in all symptoms and drop in temperature. The last signs to disappear are rigidity of the neck and Kernig's sign, and these may persist well into convalescence. Deafness seems to be the most common sequela.

Flexner's serum is bactericidal in its action, and must be brought into direct contact with the meningococci in the spinal canal and ventricles of the brain in order to be of value. All are now agreed that the serum should be given by lumbar puncture into the spinal canal.

Recent experiments have, however, revealed different strains of the organisms, some of which are resistant to the action of the serum. The serum does not promote phagocytosis in cases infected with these strains—the meningococci remain free in the cerebrospinal fluid.

Lumbar puncture, besides being of great diagnostic value, as well as serving for the introduction of serum, is also a valuable therapeutic measure in itself. It relieves excessive intracranial pressure, as well as removes toxic material and organisms from the spinal canal. In some cases it is a life-saving measure and should certainly be performed without hesitation in all cases where inflammation of the meninges is suggested or suspected. In this way only can epidemic cases be recognized early and patients be given the benefit of an early injection of serum. In other varieties of meningitis the simple withdrawal of the cerebrospinal fluid may cause marked improvement and ultimate recovery.

In most cases of epidemic meningitis the cerebrospinal fluid withdrawn at puncture is turbid or cloudy and such a finding is positive indication for using the serum. Do not wait for bacteriologic examination of the cerebrospinal fluid, inject at once.

During the first twenty-four to forty-eight hours the spinal fluid is often clear, and it is in these early cases that the best results are obtained from the serum treatment.

As much cerebrospinal fluid as possible should be withdrawn at each puncture unless untoward symptoms arise. In this way large numbers of cocci are removed and a large amount of toxic material eliminated.

As to the amount of serum, no fixed rule can be laid down. As in the use of all sera the requirement of the individual case controls the dosage. Dunn advocates the giving of as much serum as will enter without undue resistance. At least 30 c.c. should be injected if possible. In some cases 40 c.c. or more may be given. In fulminating cases 30 to 40 c.c. should be administered, regardless of the amount of cerebrospinal fluid withdrawn, unless undue resistance is encountered or unless pressure symptoms arise.

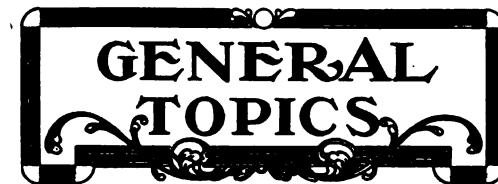
The frequency of injection is dependent upon the course of the particular case under treatment. Dunn says to give the serum by daily injections on four successive days in an average case, or until the diplococci disappear from the cerebrospinal fluid. It seems, however, that by considering the temperature curve and general symptoms of the patient, a better idea is gotten as to how often to give the serum. Let the dose produce its maximum effect before re-injecting. If symptoms are increasing or remaining stationary another injection should be given without delay. Dochez has shown that the serum leaves the meninges and enters the general circulation in about twenty-four hours after injection, and in view of his experiments the twenty-four-hour interval was evidently selected. However, improvement often continues after the twenty-four hours have passed, and in these cases it seems inadvisable to continue daily injections.

The amount of serum necessary to effect a cure varies. Some cases reported have been given large quantities. Netter gave 823 c.c. in 22 injections with recovery. Hammond gave 405 c.c. in minimum doses of 30 c.c. and maximum doses of 60 c.c. to a girl aged twelve years. It is difficult to explain these resistant cases.

In some virulent infections it may be necessary to inject the serum directly into the ventricles of the brain or a combination of intraventricular and intraspinal route may be used.

Levy noted collapse in 16 out of 160 patients treated—2 of these failed to rally and of the others 5 died during the course of the disease. He thinks collapse more likely to occur in the more severe infections.

The severe symptoms of anaphylaxis, according to Flexner, can, it appears, be disregarded.



**Special Tour for Physicians in Connection with Clinical Congress of Surgeons to be held in London, July 22-Aug. 3.**—A very remarkable tour to accomodate those American surgeons who wish to attend the great forthcoming Clinical Congress of Surgeons in London, July 22nd to Aug. 3rd, and also visit Paris has been arranged at the very nominal cost of \$300. This tour will leave Montreal Saturday, July 11, by the Allan Line Steamship, the "Scandinavian." This Company is famed for the care taken of their passengers and a most delightful voyage is assured. The complete charge of \$300 includes the following:

**First**—Berth at rate of \$60.00 on the S. S. "Scandinavian" and berth at rate of \$60.00 on the S. S. "Sicilian" (one class cabin steamers).

**Second**—Travel tickets from Glasgow to Havre in accordance with the route of the itinerary, the class to be third on railways in Great Britain, second on the Continent, and first on local steamers.

**Third**—Accommodation at good first class hotels according to itinerary, commencing with the arrival at Glasgow on July 19th and terminating upon the departure from Paris, Aug. 7th.

**Fourth**—Meals en route while traveling during the period named above for hotel accommodation.

**Fifth**—Transfer of passengers and baggage between railroad station, steamer quay and hotel and vice versa wherever necessary.

**Sixth**—Private carriage drives in the various cities as specified in itinerary, also tickets for side trips and excursions without guide where such are included.

**Seventh**—The exclusive services of a local guide on such days as carriage drives are provided, said guide to pay fees and admissions to the various places of interest visited.

*The fare does not include free transportation of any checked or registered baggage on railways, except where such is carried free of charge by the railway or steamer lines; fees or gratuities to hotel and railway servants, stewards' fees on ocean steamers, laundry, wines, mineral waters, or other such personal expenses of a similar character.*

Thos. Cook & Son give notice that the arrangements shown in this statement of agreement are made by them in their capacity as Agents only. All tickets for conveyance by Rail, Steamboat, Boat, Coach, Carriage, Diligence or Car over advertised routes are issued by them as Agents for the Companies or Proprietors advertising such routes. In all other cases the arrangements are made by them as Agents for the passengers.

Thos. Cook & Son cannot therefore accept liability for any loss, accident, delay or irregularity which may occur or be occasioned through the negligence or default of any Company or person concerned in the carrying out of their arrangements not in their actual employment.

Persons desirous of joining the tour should send a draft or postal order for \$25.00 made payable to the order of Thos. Cook & Son, 530 St. Catherine St. West, Montreal, Que., who will at once return a deposit receipt with plans of the steamers, showing the location of the staterooms or berths allotted. The full name and address of each person must be given for registration.

The balance of amount due for membership is payable not later than three weeks before date of sailing.

Only a limited number of members can be registered; therefore, to insure good choice of accommodation, it is necessary that early application should be made, as the berths are allotted strictly according to priority of application.

*How to carry funds.*—Members are recommended to carry their money in Cook's Travellers' Cheques, which are more convenient than Letters of Credit, as they are cashed by banks, hotels, etc., and at any office of Thos. Cook & Son. These cheques, and foreign money for immediate use can be obtained at Thos. Cook & Son's offices, personally or by mail.

*The tour will be carried out under the direction of Thos. Cook & Son, and will be accompanied by the organizer, Dr. E. J. Melville of St. Albans, Vermont, from either of whom full information regarding the tour may be obtained.*

**Blindness, Smallpox, and Vaccination.**—The admirable work done by the United States in the Philippines in the practical stamping out of smallpox, says the *Lancet* (May 9, 1914), though less spectacular than the elimination of yellow fever from Havana and the Panama Canal Zone, is nevertheless of the utmost value, not only for its immediate results, but in consequence of its demonstration of the efficacy of vaccination when thoroughly and radically enforced. It is well known that before the occupation of the Philippines by the United States smallpox was always endemic, and its exacerbations were frequent and severe. So far back as 1899 Dr. Llewellys F. Barker stated that when the American army first went to Manila it had a large mortality from smallpox, which was as common among the natives as scarlet fever or measles in America, a large proportion of the faces encountered being pitted. Wholesale vaccination by Dr. Bourne with the aid of 18 Filipino physicians had, however, entirely wiped the disease out. It has been for years rarely in evidence in the reports of the principal zymotic diseases in foreign places, published weekly in the United States Public Health Reports; the Report for April 3rd shows for the third quarter of 1913 only 15 cases, while the Report for the fourth quarter shows no cases and no deaths. This valuable official publication for March

27th, 1914, contains an authoritative account of a most interesting investigation regarding the prevalence and causes of blindness in Cebu. Twenty-three towns were visited, of which 12 reported blindness. In all 145 cases were examined, and the chief cause was found to be smallpox, 48 cases. Most of these smallpox cases had been blind for many years, only 3 having occurred in the past five years. The Report adds: "Since the Americans have begun the systematic and compulsory vaccination of all people smallpox is no longer a cause of blindness."

**The Truth About the Friedmann Tuberculosis Treatment.**—Requests for information concerning the effect of the so called Friedmann tuberculosis treatment, says the *Medical Record*, May 2, 1914, resulted in an effort on the part of the Department of Health to ascertain the recent status of seventy-seven cases treated in hospitals in this city at the time of Doctor Friedmann's visit. Of the total of seventy-seven patients, nineteen could not be found, while eleven were reported to have moved out of town permanently, so that nothing could be learned of their present condition. The department was therefore able to obtain a report on but forty-seven of the cases in question. The report is summarized as follows: At home, 5; in hospitals and sanatoria (indicating failure to cure), 22; attending clinics (showing need of further treatment), 7; attended by private physician, 1; died, 12; total, 47.

Comment is unnecessary; the figures tell their own story.

**American Medical Editors' Association.**—The annual meeting of this Association will be held June 22, 1914, at Atlantic City. Dr. A. Van der Veer, the president, will preside and a splendid program has been arranged.

**The Brooklyn Pediatric Society.**—A special meeting of the Brooklyn Pediatric Society will be held on May 27th. Dr. William J. Robinson, of Manhattan will read a paper on "The Limitation of Offspring by the Artificial Prevention of Conception, from the Individual, Social and Eugenic Standpoints: all Pros and Cons of the Question Carefully Considered." Discussion, for and against the views held by the speaker, will be opened by Dr. William Francis Campbell, President of the Medical Society of the State of New York; Dr. J. Richard Kevin, President of the Medical Society of the County of Kings; Dr. James P. Warbasse, President of the Associated Physicians of Long Island; Dr. James W. Fleming and Dr. Robert L. Dickinson. Dr. Robinson is editor of the *Critic and Guide*, of the *American Journal of Urology* and is the author of several works, among them "Practical Eugenics." He is well known for his fighting qualities and the meeting is certain to be a spirited one. It is to be held in the main auditorium of the building of the Medical Society of the County of Kings, 1313 Bedford Ave., Brooklyn, nine o'clock p. m.

**SOCIETY PROCEEDINGS.****EASTERN MEDICAL SOCIETY.**

## ADDRESS OF PRESIDENT

BY

JOSEPH BIEBER, M. D.,  
New York City.

"Actions and not words" has been accepted as the key note of the new administration of this great city and the Eastern Medical Society as one of the minute but effective parts of the municipality, will, I trust, lend itself to the harmony of the phrase. While I accept the custom of my predecessors on similar occasions and will indulge in a few remarks, yet I will endeavor to be both brief and general. But this brevity with which I acknowledge my election to this high office, should not be construed as a failure on my part to appreciate the importance and the honor, but most of all the responsibility of the executive office of the Eastern Medical Society.

The responsibilities and the problems encountered in a local organization such as this, while possibly not as far reaching as those of the larger societies, are nevertheless more vital and more immediate in their concern.

The basic problem of this organization, more or less by virtue of the locality of its influence, is that of the economic condition of the physician. In all walks of life, economic conditions are to a great extent responsible for the results which at first sight do not seem to be connected therewith. It is only natural, therefore, that the economic condition of the people of this locality and its effect upon the physicians, should be the source from which spring almost all of the problems which this organization is obliged to encounter.

We find that a physician practicing in this vicinity is obliged to encounter two conditions. First of all the poverty of the patients and secondly the multitude of medical dispensing institutions. These two conditions are the direct causes of the unethical practices of physicians, the entirely unproportionate remuneration for medical services, and a necessary absence of time for proper medical research and development of scientific knowledge. The unscrupulous physician in his endeavor to make both ends meet, does not hesitate to decry, criticize and slander his neighboring practitioner to the detriment of the community's respect for the medical profession.

Out of these economic conditions springs also the abuse of lodge practice and the disgraceful means employed by some of our colleagues in an endeavor to be elected as lodge physicians. And yet, how are we to prevent this underbidding when so many are oppressed with the immediate necessity of earning a livelihood?

Gentlemen, these are some of the problems which are peculiar to this organization, because of its local character. And these furthermore are problems which can only be solved right in this body of ours which consists so largely of men who live in the midst of these conditions,

who are immediately concerned therewith, and who have a direct and first-hand knowledge and appreciation of the magnitude of these problems.

Among those questions which concern the community as a whole and which to my mind have been more or less neglected by the medical profession, is the menace of the social evils and social diseases. Never was this problem more in the public mind than at the present moment and never was more effort wasted in the discussion and exploitation of this problem by those who have no knowledge, no information, no training and no experience whatever to enable them to deal safely with this problem. And the physician whose knowledge and opportunity fit him for proper discussion and reform of this matter is conspicuous by his lack of participation therein. The physician is preeminently the man who knows, the man whose counsel and warning can be sane and sober. I recommend, emphatically, that we, as representatives of the medical profession should supplant the well-intentioned but uninformed reformer, and eliminate the unscrupulous layman who under cover of reform exploits the natural interest in this problem to his own financial advantage. The medical profession should assume the leadership of this movement for which we alone are peculiarly fitted.

But after all, the discussion of these problems in and of itself will not remedy conditions. The real remedial work will only come through careful investigation and study in which all the members of this Society must cooperate. The solution of such vital problems needs the active and energetic assistance of every member of this organization. Although the consideration of these questions comes properly within the limits of our executive work, the executive committee will be at all times ready, willing and eager to accept the suggestions of each and every member.

I am inclined to suggest at this point, that dissensions and differences of opinion, whether regarding problems of administration or otherwise, should be referred first of all to the attention of the executive committee and that body should be privileged to pass upon any grievance, before any member attempts to trifle with the harmony of this Society by stirring up dissension amongst the members in general.

As a final word I wish to direct the attention of the members to the importance of our scientific sessions.

These sessions are intended to be and should be a source of enthusiasm, inspiration and confidence. It should be a method of retaining the academic grasp of questions, of continuing our thirst for learning and of receiving in the space of a few hours the results and benefits obtained by eminent physicians through years of study and application. Everyone of us should take an active interest in the scientific discussions and develop the habit of presenting such original observations as we encounter in our respective practices.

Gentlemen, I thank you for the honor of this office and I hope that with your active cooperation, this administration will at least continue, if not excel, the good work we have done in the past.

# American Medicine

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PUBLISHED MONTHLY BY THE AMERICAN MEDICAL PUBLISHING COMPANY.

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Complete Series, Vol. XXX, No. 6.  
New Series, Vol. IX, No. 6.

JUNE, 1914.

\$1.00

YEARLY  
in advance.

**Playing with the curriculum** is the charge made by Prof. E. P. Lyon, University of Minnesota, (*Science*, May 8, 1914) in a very readable and valuable address to the Association of American Medical Colleges. The article contains so much good that it is a shame to take issue with any part of it, but the very idealism which pervades it, is quite sure to interfere with the practical points at issue. It is certainly a cause for rejoicing that the need of reform is universally recognized and that every college in the land is tinkering at its own faults. One curriculum required 230 hours of electro-therapeutics and another 1,300 hours of anatomy! And this for every student whether he was to be an internist or anatomist. There now seems to be a general recognition of the fact that medical science is too enormous in extent to impart more than the bare fundamentals to each student, and moreover the minimum requirements in each of its many branches are being reduced to a point which would make our own teachers turn in their graves. Lyon now emphasizes the inequality of all men, and the impossibility of teaching any two alike. That is, the future college is destined to allow great latitude in electives for intensive study after the basic fundamentals of all the subjects are acquired.

Graduation will be permitted at any time the faculty thinks the student has acquired

enough knowledge and skill to be licensed to practice in his special field. This is too startling an innovation to be considered judiciously and judicially now. We must all ruminate over it awhile. It will certainly develop narrower men than the present way of evolving specialists out of the mass of general practitioners. But then, in the future cooperative practice of "teams" of medical firms, narrowness will not be such a drawback, as where one physician has sole charge of a case. The modern principle is "a thorough training in a definite direction."

**Exaggerating the possibilities of medical college training** is the great fault at present. Success depends more on the brain in the student's skull than on the brains in the faculty. The big mind does big things in spite of bad early training and the little minds, just big enough to pull through the course of our "best" schools, are proving that the most scientific curriculum will fail with an ass. Lyon says that the college must turn out "finished" doctors, but he defines them as keen observers, trained experimenters, skilled technicians, possessing good character, judgment and ability to think. These qualities are given to the student by his parents, not his teachers, and though we must exercise care to exclude from the course those who are

notoriously lacking, we cannot expect superlative excellence. The duty of the college is to make safe practitioners of the available material which is largely mediocre, and not expect any of it to set the world afire. A mediocre man may be successfully trained in a limited sphere, and for this reason the "elastic curriculum" has come to stay; that is, a course which allows some to take more or less of any branch, and which allows of certain electives, omitting non-essentials which are merely "desirables." The college is not designed to train research workers, but to train practitioners who put to use the results of the researches of men who cannot practice. It does seem that the long expected revolution in medical teaching is already going on without any fuss or feathers, but by the gradual process of evolution.

**Premedical education** is also receiving a very desirable overhauling. Dr. Paul G. Woolley of the University of Cincinnati describes some of the results of the conference held at his school last January, (*Science*, May 22, 1914). The general impression one gains is that the teachers are trying to do too much. The average age at graduation is already 27.5 years and this should be lessened rather than lengthened. Nevertheless, the desire seems to run in the direction of limiting the number and scope of the preparatory studies and make it possible for the student to end his academic preparation in two or three years, although his alma mater may withhold his degree until he has covered certain ground in the medical school where he can do it better and quicker. It is also pleasing to see the concerted action to eliminate duplication of work now existing in graded schools, high schools, colleges and medical schools—an

evil which causes very great waste of time and effort. The public school teachers are also at work on this problem and we hope that the time is not far off when a subject will not be given to a child until he is old enough to understand it, and that he will then be kept at it until he finishes it, never to be drilled in it again. The same rule applies to the studies necessary to understand the medical branches. The student now nibbles at them in several schools, often to his great injury. Taking it by and large, the present critical attitude of all teachers is a sign of a wholesome awakening from the apathy which has so hampered education. Let us repeat a final warning against the overeducation which stunts the mind instead of training it.

**A State Commission on Ventilation** under the chairmanship of Prof. C. E. A. Winslow, Professor of Biology in the College of the City of New York, was created last year owing to a bequest of the late Mrs. Elizabeth M. Anderson. As he and all the other members of the Commission are eminent workers in sanitation, hygiene or medicine, we may confidently predict that the recent revolutionary statements of what constitutes bad ventilation will be placed on a firm and permanent basis of carefully observed experiment. We have called attention to the fact that it has been claimed by Leonard Hill and others (*Proc. Physiol.*, Oct., 1910.) that the harmful factors in "close-rooms" are the heat and moisture. If the air is cool and dry, there are no appreciable ill results of a considerable increase of carbon dioxide and "organic matter" and great decrease of oxygen. Moreover, hot moist air which is causing great distress, will be comfortable if it is merely stirred up by fans, and the

nervous and mental symptoms due to the bad air will disappear. Systems of ventilation are now being devised to use the air over and over again to save the expense of heating up so much cold outside air which merely escapes through the cracks, windows and doors. Enough oxygen must be introduced to replace what we use and some "fresh air" is necessary, but it is a mere fraction of the amount we formerly believed necessary. Our besetting sin is the overheating of our houses, and it partly accounts for our deplorable tuberculosis record particularly in places with a cold winter which keeps so many people indoors weeks at a time. Nevertheless, we must not rush into the extreme of insufficient fresh air. Prof. W. G. Anderson of Yale takes strong exception to the conclusions of Leonard Hill, and asserts (*Medical Times*, Jan., 1914) as a result of his own experiments "that the CO<sub>2</sub> factor is without doubt an important one, if the gas is present in large amounts. It is an undesirable element, insidious in its effects, if habitually and continuously breathed in small amounts above the normal percentage," and that agitation of the air relieves the unpleasant symptoms for a short time only. When careful experimenters come to such widely differing conclusions, one or the other has evidently reasoned on incomplete data. The truth may be half way. Recently experts have inclined to view that the deaths in the "Black Hole of Calcutta" were due solely to thermic fever, but we must hold the matter open again, for the old theory of air poisoning may have been at least partly correct after all.

**The deplorably bad ventilation of public buildings,** such as libraries and post-offices, has been noted times innumerable, and yet

the responsible officials seem unable to remedy the evil. Some years ago, an investigation of tuberculosis in the executive departments in Washington, revealed an appalling state of affairs. Many were working in hot stuffy places utterly unfit for human occupancy. We gained the impression at the time that these men were all being infected by contact, but we now know that in each one of them a latent focus of tuberculosis was lighted up by the hot, steamy conditions in which he lived. Proper ventilation then is a far more vital matter than we formerly considered it, and it is high time for reform. It is bad enough to step into a post-office and find it stifling hot and the moisture dripping from the windows—a few minutes in such a sweat box may render us liable to colds when we go out—but that is insignificant compared with the damage being done to the clerks who stay in the reeking tropical atmosphere all day long. Public libraries have been dreadful offenders in the past, and though there has been a marked improvement in recent years, most are still far from perfection. Architects have neglected the matter but when we get something definite from the new ventilation commission there will be no excuse. Plans for public buildings should not be accepted unless they call for a fool-proof system which ignorant janitors cannot disarrange.

**The bad ventilation of the New York City subway** seems to defy all the remedial efforts of the engineers, though there is a suspicion that they have not made as strenuous an effort as the importance of the matter demands. We understand that the old style analyses of the air do not show anything specially wrong in the composition of the air, so we are forced to conclude that the trouble is merely one of excessive

temperature with perhaps a higher humidity than is comfortable. The machinery must be warming up everything by the heat of friction and the bodies of passengers must add greatly to both heat and moisture and there seems to be no practicable ways of removing the surplus heat. What fresh air is introduced, comes from the street which at times is so hot that the remedy is worse than the disease. An equipment to pump sufficient cool air into the tube may be so expensive as to be prohibitive, yet it is possible that it would be profitable if it brought back the passengers who prefer the surface and elevated in hot weather. There have been no cases reported in which the subway air has been accused of being a causative factor, but we all know that a half hour in such an atmosphere must make a serious impression on a system already disturbed by disease—not to mention the climb up the steps afterwards. We hope the matter can be solved, if only for the comfort of those unhappy mortals whose struggle for bread and salt compels them to enter these sweat boxes several times a day.

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**The value of cool air for fevers of all kinds** seems to be recognized more and more. The extraction of body heat by cold water saved at least six per cent of typhoids and a few enthusiasts considered the cold bath almost a specific. Such laudatory reports rather blinded us to the fact that there are other ways of getting heat away from the body which might be even more efficacious and less disagreeable. It is now known that the physiological result of sudden loss of heat by a low degree of cold, is an increased production of heat and a constriction of the superficial vessels to prevent

further loss, thus necessitating frequent repetition of bathing. This was overcome by the hot bath as its reflex result is a lessened production of heat and a dilatation of superficial arterioles to enhance radiation. Excellent results have been noted in these columns, and also the vast benefits sometimes seen of aiding radiation by a gentle movement of air from an electric fan placed sufficiently far away to prevent the opposite effect of closing up the vessels through chilling the surface. Now comes O. H. Brown (*Interstate Med. Jour.*, May, 1913) with what he calls "the continuous cold air bath," by which he means keeping the room temperature down and removing sufficient bed clothing to permit radiation. He states that though the patient may complain temporarily he soon becomes comfortable from the adjustment of skin circulation to the conditions. If too much covering is removed the effect is the same as a cold bath, but by proper regulation the patient loses heat continuously and the body temperature remains at a low level without baths. The breathing of cold air may also assist in lowering temperature. Brown states that the cold air treatment so successful in pneumonia is just as reasonable in typhoid. Perhaps it might prevent the complication of pneumonia. Typhoids in hot weather are much more severe than in cold. Should bathing become necessary, Brown states that the ideal bath is a sponge, warm at first and gradually cooled, using friction to keep the vessels dilated, but the results of hot immersion baths seem too good to be ignored. Lastly the present plan of giving copious draughts of cool water and cracked ice *ad libitum* seems rational and certainly helps to reduce temperature as well as assists in removing soluble toxines by way of the kidneys.

**Cooling hospital wards in summer** has been a practical success in Mt. Sinai Hospital, New York City, where it was tried last summer in one small room for children with enteritis. They had but one death in sixteen cases whereas in prior years the death rate would run up to 25 per cent or over. It has been alleged that the "summer complaints" of infants in ordinary wards or at home were not nearly so fatal last year as formerly, so that the exact value of the cool air in this complaint is not yet known. On the other hand it is a matter of common experience that a run of excessively hot sultry days will kill every very sick infant in a ward. As an emergency measure for such "heat waves" the cooling apparatus is an essential of modern therapy. Tropical experience, particularly in the dysenteries, is conclusive that the critical temperature for northern races is somewhere near 80 or 82° F., every degree above that point decreases the chances of recovery and every degree below makes recovery more certain and prompt. We are informed that heart cases seem to lose compensation in summer more frequently than in winter as though heat had something to do with it. Indeed we are safe in saying that practically all sick people need cool or cold air and that eventually all hospitals will be equipped with apparatus which will furnish any degree needed. The cost is not prohibitive if we wish only 70° to 75°. In view of the above revelations as to ventilation, we do not have to supply nearly as much fresh air as we once thought, and it should be practicable to keep some rooms actually cold in the hottest weather at a moderate cost. Why not equip all wards with a profusion of electric fans for hot weather? We all know of cases of typhoid fever which have been wonderfully bene-

fited this way, and perhaps we all know of cases which have died for the want of air movement.

There are a number of practicable systems of cooling the air before delivery but architects do not seem to have adopted the simple expedient of using compressed air, which cools greatly when it expands and is delivered into a room. This is said to be the way some staterooms are cooled on modern warships, and compressed air is taking the place of the ammonia and brine system of cold storage.

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**A year in prison for libelling Ehrlich** is the sentence imposed on an editor in Frankfort-on-Main, who had stated that the manufacturer of salvarsan had resorted to illicit practices to sell the new drug, and had administered it in the City Hospital to women against their will and had killed several of them. As the defendant did not substantiate his charges he was convicted.

It seems that Ehrlich was not required to prove the statements false, but his mere charge that they were false put the burden of proof on the defendant. This course is exactly what we have repeatedly urged upon Flexner, Holt and others who have been so viciously libelled by the antivivisectionists. It is almost beyond human endurance to submit to the foul accusations from zoophiles, whose mental operations are so warped that they cannot understand the facts they observe, but who put the most sinister interpretation upon acts which are perfectly proper as in the horribly libellous charges against Dr. Sweet in Philadelphia. The medical profession has been on the defensive too long, for it is only inviting attacks to turn one check when the other has

been slapped. The progress of medicine is being checked and we owe a duty to humanity to imprison those who have been falsely attacking us. It won't do merely to defend ourselves against those who bring false suits for malpractice, since the freedom from punishment on failure to substantiate the charges, tempts others to take a chance. Failure to prove such charges should result in the imprisonment of the plaintiff, should it be shown that they are without basis in fact, and particularly if they are preferred merely as a species of blackmail. Our meek and humble attitude of self sacrificing altruistic laborers for humanity is false anyhow, and why not stand up like other men who work for their living and strike down those who are striking us down? A little belligerency will stop these outrages, as the British are beginning to think in the case of their militants who have been tolerated so long. Salvarsan may be a "treacherous drug" as Graucher reports, and it may kill many from arsenical poisoning as the British now also seem to believe, and it may prolong syphilis instead of curing it, but all that is no excuse for the libel for which the editor was punished.

given to it by certain German physicians, and whether they still approve it. If there is any good in it at all, it must go back to the laboratory whence it should not have been dragged so prematurely. It is now outside the sphere of practical therapy and must remain *tabu* until the research workers have experimented further. This is a great disappointment, because the use of a virulent bacilli of non-human type, has appealed to many a pathologist as a possible solution of our tuberculosis problem. Non-human organisms are preventing smallpox, and why not apply the same principle to bacteria? There is a prospect of success in the end, and we hope that the matter will not be dropped because of this early failure.

**Another adverse report on Friedmann's vaccine** was made to the Berlin Medical Society May 13, by Professor Karewski. He had made a long investigation and concluded that it cured none, and improved only one in fifty-four cases. It was not a preventive, and did not "strengthen" the tubercular patient's system. It is not harmless though it caused no deaths and the preparation sold is frequently unclean. Similar reports had previously been made both here and in Europe, and now we would like to learn what grounds there were for the strong approval

**The deterioration of digitalis** is not generally known by the medical profession and the matter must be looked into since this drug is now a matter of life and death to a large number of patients who must take it in small doses for prolonged periods. The assertion was recently made at a medical gathering that an examination of some samples which had been exposed to the air, revealed the astounding fact that there were differences among them amounting to three hundred percent. This will fully account for many a curious reaction to the drug and the discrepant views as to the proper dosage. It reminds one of the alleged enormous doses of quinine needed to cure malaria in the Civil War, when in fact the patients were taking ordinary doses in tablets which were underweight. In prescribing digitalis therefore, one should not only be sure that the preparation has been so standardized that we know that a certain quantity has a certain measurable effect but that there

has been no deterioration. Better buy in very small amounts and throw away the old, rather than run any risk of failing to give a wobbly heart its necessary assistance. Above all else better buy from makers whose word is known to be good. We must trust someone, so let us rely on only the trustworthy.

**Are the lepers of the United States a menace?** Dr. Isadore Dyer of New Orleans thinks so, and urges all the states to follow the example of Massachusetts, California and Louisiana in establishing the system of segregation and control. (*American Jour. of Tropical Diseases*, Vol. I, No. 6). He thus squarely contradicts the other experts who are of opinion that the disease is very feebly contagious in northern countries, if at all, and who approve the English and French system of permitting lepers to go and do as they please. We know that none of the hundreds of lepers in Paris and London have given the disease to anyone else, and we are now credibly informed that the hundreds of lepers who have lived in New York City have never infected anyone else. Every case is an importation. The danger, if any, will never be known until we discover how lepers contract the disease. Until then it might be the part of wisdom to isolate them, since we are nearer the tropics than London, but there is positively no warrant for that hysterical and brutal public attitude towards lepers which is created by such gloomy articles as Dyer's. If several cases arise in a certain area, they may not have contracted it from one another but from a common non-human source. It is claimed that ordinary cleanliness is a safe guard, and it is certainly a fact that cleanly Europeans are rarely affected in tropical

places where the disease is rife among the dirty natives. Let us, then, be easy with the leper Early who has returned to bother the Washington authorities. A committee has been appointed to determine how dangerous he really is, but it is difficult to see how they can say he is any more dangerous than the hundreds who have been tolerated in New York City as harmless. Indeed the committee cannot truthfully say that he is dangerous at all. They know nothing about it.

**The mortality from measles** is so great that the medical profession should take immediate steps to disabuse the minds of mothers that the disease is so trivial that no pains need be taken to prevent their own children contracting it or giving it to others. The last census report shows that in the registration area it caused seven-tenths of one percent of all deaths, or about ten per 100,000 of population. More recent estimates place the deaths at one percent of the total mortality from all causes, but if we include the cases reported as bronchitis, pneumonia or tuberculosis, it is safe to say that it causes much more than one percent and that the total yearly deaths in the country are 12,000 or more, mostly young children. The census report says: "Undoubtedly sufficient attention is not given by the health authorities and by the public to the restriction of this disease." We heartily concur in this opinion. Experience shows that the public needs instruction and that it complies with reasonable restrictions as soon as it learns the necessity. Laymen are not fools and will not intentionally kill their own offspring, nor will they deliberately murder other children. The deaths are more numerous in cities where the rate may be as

high as 53. The disease is now quarantinable in New York State and the restrictions upon school attendance should be much more rigid than the law requires. People must also be told that it is infectious even before the stage of eruption and perhaps as long as there are nasal discharges.

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**The manner in which infections are transmitted** is being slowly explained. At one time the facts seemed to prove that there was a gaseous miasm surrounding the sick, and sanitarians estimated the extent of the danger zone in each disease. We have now learned how we contract cholera, amoebic and bacillary dysentery, plague, typhus, relapsing fever, yellow fever, malaria, sleeping sickness and tetanus. In these the air has been absolved. The danger zone is the distance the carrier may travel, but the patient is harmless if carriers are excluded and sufficient isolation is practiced to disinfect the germ laden discharges. In the case of whooping cough, diphtheria, tuberculosis of the lungs and pneumonia, there is a decided danger zone since it has been proved possible for the living bacilli to be carried some yards in spray or droplets expelled in coughing. There seems to be no dissent from the opinion that these cases must be isolated sufficiently to prevent such a transfer of the bacilli. Separate rooms are necessary, indeed separate apartments or houses are preferable. The old practice of crowding in the pneumonias and consumptives with other cases is luckily a thing of the past. In the case of scarlet fever, chicken-pox, measles and smallpox we must remain in ignorance until we find the causes. A few physicians are so sure that the danger zone is very narrow that they do not hesitate to treat the first three in a com-

mon ward, care being taken to separate the beds sufficiently to prevent droplet infection. Others treat them in small rooms opening from a common corridor. In each case it is claimed that if the nurses are careful to disinfect their hands after handling a case and to avoid contact with their own clothing, there is no danger of transferring the disease. In a recent extremely interesting paper on Asepsis and Fever Nursing in the *Medical Officer* (May 16, 1914) Knyvett Gordon speaks of the importance of hand disinfection and points out the wisdom of employing rubber gloves, in enteric wards especially, to protect the staff from infection when handling soiled linen, etc., and in treating the mouths of patients. It was in 1902 that Gordon first commenced the use of rubber gloves at Monsall Hospital and a marked diminution in the incidence of enteric fever amongst the staff employed in the wards devoted to that disease was immediately noticed. As a result the use of rubber gloves became more general and they were employed henceforth in scarlet fever and diphtheria wards for all throat treatment, and dressings. Before putting on the rubber gloves, each nurse carefully sterilized her hands in the usual way; a pair of recently boiled gloves were then pulled on. After attending to each patient, the nurse held her gloved hands under running water for 2 minutes, after which they were immersed in a weak antiseptic solution. That such a method reduces the danger of hand infection to a minimum cannot be doubted. Still, even with all of these precautions it is doubtful if many physicians would sanction placing scarlet fever, measles and chicken-pox patients in the same ward and the fear of public criticism, should cross infection occur, will probably prevent the majority of the profession from

adopting this system. Besides, children are hard to control when convalescent, but still able to transfer the infection, and undoubtedly are responsible for cross infections if not carefully isolated. It has been well said that no doctor would willingly permit his own child, with measles say, to be roomed with another having diphtheria or scarlet fever, and the public may demand the same consideration until we know the exact medium of contagion.

The "raft" theory of contagion is coming up for renewed discussion. That is, pathogenic organisms may adhere to minute particles of dust and be wafted quite a distance by gentle currents of air, and this increases the danger zone. No doubt most of the dried organisms are dead, but some kinds may live in a virulent condition for a long time as we have proved in the case of tubercle bacilli and smallpox. These can also be transferred on fabrics or merchandise and to this extent the old idea of fomites is still held, though no one thinks of it in the mystical way we once thought of the transfer of cholera, plague and yellow fever in a ship's cargo. Similarly moist germs can be carried adhering to drinking cups as proved in the case of syphilis, or on lead pencils passed from mouth to mouth of children as in the case of diphtheria carriers. The above, as well as the transfer of typhoid and other bacilli in food or water, constitute the modern idea of fomites. Dust, then, may act as the carrier of those germs which can stand drying though it is not the medium of those like cholera bacilli which so promptly die when desiccated.

The controversy over terminal disinfection still keeps up. The American Public

Health Association, to the consternation of not a few physicians, has approved Chapin's theory that pathogenic organisms alighting on walls, hangings and furniture are dead, and that it is not necessary to disinfect a room after the patient has left it. The bed and bedding of course are disinfected and anything which has been soiled by discharges. Chapin thinks that infection in the exanthems is spread by a more or less close contact with a carrier, and not by contact with fomites either in the old or modern meaning of that word. The majority of the profession still seem to be of the opinion that in our ignorance of the causes of the exanthems, it is like tempting fate to omit disinfection and probably none of us would put his own child in a room which recently harbored a contagious disease, unless disinfected. Similarly, all of us, even though we were perfectly convinced that we were immune to tuberculosis, would decline to use a bed or room recently vacated by a consumptive. Phthisiographers are not consistent in strongly denying that consumptives are dangerous and yet insisting upon the disinfection of the rooms and houses occupied by these invalids, but probably the majority of physicians approve this inconsistency on the ground that we might get an overwhelming dose of bacilli in an undisinfected room in which a consumptive had recently died.

Should schools and hospitals be disinfected periodically? We insist upon the occasional disinfection of railroad cars and the cabins of steamboats but say very little about schools. Hospital wards in constant use with infectious cases rarely get a disinfection in any country, except the wards used for smallpox. Crowds are known to be exchanges for "swapping" all kinds of

germs and vermin, and some recent epidemics of diphtheria in schools have been definitely traced to carriers and not to the room itself or the furniture. Similarly it has been held that cross infections in hospitals are rarely found if care is taken to prevent contacts. Dr. D. L. Richardson, superintendent of Providence City Hospital, says (*The Modern Hospital*): "It is only the things that are soiled by the infecting material that are particularly dangerous" and that this material is not so widely distributed about the bed clothing and furniture of a room as is commonly supposed. As he has never had a case whose infection was derived from the room itself, he omits fumigation. The ambulance is merely washed between calls, as the cases are in it too short a time and are so well wrapped up that they do not infect anything. The profession does not seem ready to take this extreme position and will probably demand room disinfection for some time yet, though they may be willing to omit a fumigation which is too often a mere rite anyhow, with no penetration into fabrics or cracks and with little germicidal effect where it does penetrate. As a matter of fact, the value of fumigation has been open to question for some time and a good many sanitary workers seem inclined to prefer the use of the disinfectant spray as infinitely more efficient and reliable. Some time ago the *British Medical Journal* stated in referring to fumigation: "On the ground even of economy there is no comparison between this obsolete process and the disinfectant spray; and while cases of renewed house infection are familiar to almost every medical officer in this country, we have Dr. Du-jardin-Beaumetz's authority for saying that where the disinfectant spray has been intro-

duced they are practically unknown in France."

On the other hand there is equal reluctance to take the extreme position of indiscriminately using disinfectants whether they are needed or not. In time, of course, we will disinfect only what we know to be infectious, but for the present the general opinion seems to be that in doubtful matters it is better to be safe than sorry even if we do waste a little time, money and some good disinfectants. We have taught the public to demand terminal disinfection and must continue the practice until it is proved to be useless.

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**The disappointing typhoid record of 1913** must be studied by sanitarians to find the reasons why there was practically no change in the average rate of our 51 largest cities, as compared with 1912. Twenty-six had a lower rate in 1913 and twenty-five a higher. There had been such a wonderful improvement from 1906 to 1912 that we had expected a continuation of it; so it comes as a shock to learn that Cleveland, Detroit and Albany had enormous increases in their respective death rates. Chicago had an increase in spite of disinfection of the water supply with hypochlorite which is credited elsewhere with reducing the rate very markedly. Inland waters seem to be getting more and more polluted, and we must discontinue their use for drinking purposes or stop their pollution.

The *Journal of the American Medical Association* correctly analyzed some of the figures and showed that improvement is due to better sanitation and retrogression due to sanitary faults. Yet in discussing the

improvement in the army it switches completely around, asserts that typhoid inoculation is the sole cause, and intimates that sanitation has nothing to do with the results. Before the introduction of inoculation in the army, soldiers had less than half as much typhoid as men of their ages in civil life. Since then this marvellously efficient sanitation has been further improved and ought now to be keeping the infection from soldiers still more efficiently. Nevertheless Dr. F. F. Russell of the army who is largely responsible for the introduction of inoculation has repeatedly asserted

8.4; Oakland, Cal., 9.1; Cambridge, Mass., 9.2.

**Tuberculosis following anti-typhoid vaccination** has been reported sufficiently often to be accepted as a fact in spite of the denials of the antivaccinationists. Russell strenuously denies that such results have occurred in the army but the figures he publishes do not sustain his contention. (*Jour. Amer. Med. Ass'n.*, May 2, 1914).

Cases of tuberculosis of all kinds per 1,000 soldiers:

	U. S.	Phil. Is.	Alaska	Hawaii	Transports	Total
1908	3.99	6.10	2.96	3.92	3.46	4.39
1909	4.53	5.06	3.76	2.96	3.00	4.53
1910	3.34	5.46	1.85	4.10	0.80	3.65
1911	3.64	3.77	2.68	1.99	1.76	3.55
1912	3.25	5.02	4.16	2.07	2.74	3.49

that his vaccine deserves the whole credit for a success second only to the prevention of smallpox by Jennerian vaccination, thus intimating that the soldiers are now exposed to infection from failure of proper sanitation. It is extremely doubtful if the sanitarians of the world will agree with him. At present we must decide that sanitation is the cause of reduction of typhoid in the civil population. Travellers should keep a list of the typhoid rates of the places they visit, so as to be extra careful in the dangerous ones, such as Toledo, Ohio, 41.8; Nashville, Tenn., 36.1; Birmingham, Ala., 36.1; Memphis, Tenn., 30.1; Detroit, Mich., 27.5; Albany, N. Y., 27.4; Indianapolis, Ind., 24.5; Baltimore, Md., 23.6; Louisville, Ky., 21.7; Kansas City, Mo., 21.6. The safest places to visit are: Seattle, Wash., 4.9; Bridgeport, Conn., 5.4; Cincinnati, O., 6.4; Scranton, Penn., 6.4; Patterson, N. J., 6.8; New York City, 7.0; Spokane, Wash., 7.2; Portland, Oregon, 7.8; Newark, N. J., 7.9; St. Paul, Minn., 8.3; Boston, Mass.,

The percentage of soldiers vaccinated in 1909 and 1910 was not large enough to make much impression. Vaccination of recruits was ordered in June, 1911, and of everyone over 35 or 45 in Sept., 1911 but not carried out until later in that year or early the next. Tuberculosis immediately increased in the Philippine Islands, Alaska, Hawaii, and on the Transports. In the United States there was a decline but not as much as normally and it is still about double what it ought to be. The figures sustain the contention that the vaccine acts like tuberculin, but the activation of latent lesions soon subsides unless the patient is living under bad conditions. We must also remember that the vaccine seems to produce a temporary reduction of the normal immunity to pus organisms in the same way as the living bacilli do in typhoid fever.

**Should we be vaccinated if we visit typhoid places?** That question is now being asked, and thoughtlessly answered in the

affirmative, but the frequent reports in New York City of serious illness following vaccination should warn us. We have knowledge of four cases in whom the vaccine was at least a contributing cause of death in this vicinity in the last six months, one a diabetic in whom tuberculosis was activated, and who died in nine days, one a case of chronic heart lesion who died of septic endocarditis, the third a young man in apparently perfect health who died of multiple abscesses in the lungs a few weeks after inoculation and the fourth who died with the evidences of profound sepsis. The explanation that these are all mere coincidences or typhoid contracted before inoculation can no longer be accepted. It is not consistent to exonerate the vaccine in one case because the death was not due to typhoid and in another because the symptoms were typhoidal. We must therefore advise inquirers that if they are in as perfect health as soldiers, they may run the slight risk of being injured by the vaccine, but that they themselves must assume the responsibility should they have any concealed disease which contraindicates the operation. To vaccinate a sick person is nothing short of a crime. We must also tell them that in the vast majority of cases the vaccine confers an immunity which is very effective for a few months but fades in less than two years. Since it confers no protection on those who are specially susceptible to typhoid fever, everyone must assume he is susceptible and observe the same sanitary precautions as to food and drink as though he were not vaccinated. Summer boarding houses and hotels are beyond inspection limits and cannot be trusted as they confer much typhoid. A vaccinated Massachusetts militiaman lost his life from typhoid fever last fall because he was not careful. The vaccinationists have been widely publishing

the cases of typhoid in the unvaccinated but say little of these failures.

**Anti-typhoid inoculation for nurses** seems to be considered necessary by the majority of physicians, at least for those nurses who have charge of typhoid cases. The results so far have been so good that it seems almost medical heresy to doubt them. Yet we hear some say that the figures are too good to believe. There is a growing suspicion that something else is aiding the nurses to escape infection, especially those who have been inoculated more than one year. As previously mentioned we are informed that there has not been a case among the nurses of the Massachusetts General Hospital for five years, although an average of ten percent have not been inoculated. If ten percent have managed to avoid infection, it is reasonable to assume that the ninety percent who are inoculated have also avoided it. Six or seven years ago, we suddenly realized that typhoid fever patients were exceedingly dangerous, and that nurses had from 8 to 20 times more typhoid than women in other employments. Then nurses began the habit of taking extraordinary precautions to avoid infecting their hands and clothing, and extraordinary measures of cleanliness and disinfection every time it was necessary to touch the patient. Perhaps this is saving the nurses as much as the vaccine—perhaps more. The nurses of Paris are violently opposed to compulsory vaccination if we can believe the press reports, because of the bad results that have sometimes followed. The subject has no scientific standing yet because it has never been discussed, and it is known that in France at least some very important facts have been suppressed by the vaccinationists who have had the field to themselves.

**Misconceptions of the etiology of insolation** are quite common, even among those physicians who assume they have enough knowledge to write articles for professional and lay instruction. Few of them seem to know that three distinct forms of the condition have been recognized and that any two or all three may coexist, thus accounting for the almost infinite variety of cases we meet in practice. Thermic fever or what is generally understood as true sun-stroke is due to heat and heat alone. It may occur at night or in hot fire rooms. Its characteristics are fever and an asthenic state with more or less coma, and its treatment is the withdrawal of heat as soon as possible. The ice bath with antipyretics caused a great reduction of the death rate, but certain Frenchmen have reported greater success with hot baths which dilate the superficial arterioles and thus favor loss of heat by radiation and evaporation if a gentle current of air later plays over the body. In cases of great urgency where every second's delay counts against the patient we would think the hot bath unsuitable. No one has tried the preliminary use of cold water to extract the heat, and the gradual change to warm or hot to dilate the superficial capillaries.

**"Heat exhaustion" is a condition of shock.** There is ample evidence that it is a paresis due to excessive light and that heat has nothing to do with it. It ought to be called actinic shock. In insects which fly too near the cold ultra violet rays of such lamps as the uviol it is seen in all grades from mere weakness up to instant death. In man it is rarely if ever fatal as it is difficult to apply enough light to do more than injure or destroy a few superficial cells. It is rare in negroes and others whose pigment

keeps out the light but it is quite common in the blond. Its symptoms are the exact opposite of those due to heat. The temperature is normal or subnormal, pulse weak, skin wet, and there is no loss of consciousness, but a general asthenic state. The treatment is instant removal to the shade and the administration of heat and stimulants. It is difficult to get exposure to light without also receiving heat, as in sun-exposure, hence the cases are generally complicated with more or less thermic fever. Pure forms are rare. Dark skins absorb heat easily from hotter sources, so that in conditions of very high air temperature, dark men suffer more from thermic fever than those of light complexion. In more moderate heat, below 98°, the dark men have an advantage because they radiate better. The negro is therefore suited to his natural habitat where the air temperature is rarely over 90° and the light is excessive. In such conditions white men suffer unduly from both heat and light. Aron's experiments in Manila show that monkeys are so well pigmented that they never suffer from "heat exhaustion," and if there is a movement of air they never get thermic fever, but if the air is still and temperature high they are as susceptible to thermic fever as negroes in like conditions.

**Heat cramps** is the third condition of insolation. It is due to the withdrawal of water by excessive perspiration, and its symptoms are identically the same as in cholera or any other disease in which the body fluids are drained off by the bowel. The temperature may be normal or subnormal and all the muscles are thrown into more or less spasm. The mortality is dreadfully high because of the effect on the heart. No reports have been made on that matter but it seems that the heart stops in systole

strongly contracted. It is common in hot fire rooms but naval surgeons have learned to cure it almost miraculously by restoring the lost fluid, intravenously in desperate cases, but in any other way practicable, by mouth, rectum or subcutaneously. Negroes are the greatest sufferers because they perspire so enormously in a heat greater than 98° when their dark skins absorb so much more heat than white ones. We must teach people to drink plenty of cold water frequently when perspiring, but avoid ice water unless taken in such small amounts as a half glass. It is evident that heat cramp may complicate thermic fever or actinic shock though it may exist without either. The literature has a great deal to say of kidney complications in insolation, but it is extremely doubtful whether any of the symptoms are uremic in origin except possibly in the severe cases of cramp, but even there the cure is complete by restoration of the water without removing any alleged poisons from the blood.

**Hygienic rules for the summer** should emphasize the necessity of avoiding the sunshine, and of wearing opaque clothing if we must be out. Nature generally selects yellow for animal coverings as it conceals and also reflects the rays. Black is the most comfortable in the shade as it radiates best and is used by nocturnal animals. Feathers are non-conductors and black is harmless to birds in the sun. White of course is best for sun exposure providing the cloth is opaque like fur or feathers. Tropical birds are often white, and most of arctic animals and they all have unpigmented skins. In the tropics the white reflects the rays, but—the arctic checks radiation of body heat and aids concealment. White horses, on the other

hand, have black skins in sunny climates as the hair is too thin to exclude all light, and we too should have dark underclothes if we wear thin white outer garments in the sun in summer. Less fuel food is needed but we ought not to reduce the nitrogen for we might need more in such exhausting conditions. The bowels must be free. Few drink enough water and all take it too cold. It is wrong to exercise as much as in winter, and it is best to rest in the heat of the day if the search for bread and butter permits. Above all else, tropical experience shows that hot baths are better than cold. There is entirely too much retinal irritation in summer, and if we are exposed to much glare, dark glasses are necessary—the blonder the person the darker the glass. Yellow, and green or combined yellow and green are the best because they exclude the harmful rays at each end of the spectrum and transmit the visual ones thus permitting accurate vision without the strain of the dim light of smoked glass.

**Alum in Bread.**—The Referee Board of Consulting Scientific Experts, appointed to insure that no hasty and ill-considered decisions should be saddled on the Food and Drugs Act, commonly known as the Pure Food Law, according to *Life and Health* (July, 1914), has given careful consideration to the effect of alum on the human organism, and has arrived at the unanimous decision that in the quantities ordinarily taken in biscuit, it is not harmful. At least there is no reason, apparently, for the manufacturers of cream-of-tartar powders, sold at a high price, to maintain that the latter are more healthful than the alum powders.



## MEN AND THINGS



**Jacob A. Riis.**—New York City has lost a great benefactor in the death of Jacob A. Riis, which occurred at his summer home in Barre, Mass., on the 26th of May.

Indeed all humanity is a loser, for his work has been copied throughout the world wherever it was known. It is not exaggeration to say that no other human being has ever accomplished so much single handed in prevention of disease. We are almost ashamed to say that this kind of work which is pre-eminently in the sphere of preventive medicine is too often taken up by laymen—and in this case, of all improbable men, a police reporter.

Riis was born in Denmark in 1849 and received his education in the Latin School. He came to New York City a penniless young stranger and tasted the bitterness of abject poverty before he drifted into his life work. His daily labors brought him into contact with the conditions of the slums and his unusual mind suggested remedies. Then began that long crusade for air. He established small parks, play grounds and model schools and tenements. He did much to demolish the frightfully unsanitary rookeries, many owned by a rich church, which to its eternal dishonor and disgrace, paid men to resist the passage of remedial laws. Probably no other man has shown the world so much of the conditions surrounding the poor. His eight or ten books, numerous magazine articles and still more numerous lectures were wholly devoted to this subject. His one departure was the biography of Theodore Roosevelt, a friend and co-worker since the days they met when Roose-



velt was a police commissioner. In this case, at least, we are inclined to think that Roosevelt shined in the reflected glory of Riis' brilliancy.

Social workers who attack their problems with hammer and tongs would do well to imitate the lovable, gentle and almost holy kindness and humor which came so naturally to this altruistic and self-sacrificing philanthropist. He could persuade and lead those who can never be driven, but he did not hesitate to denounce when necessary. All told, we must give him a large share of the credit for the progressive reduction in New York City's death rate—particularly the improvement in tuberculosis. The least we can do is to name a street, a park, a playground, a school, a big model tenement and a lot of other things by his name. We will thus honor ourselves by trying to honor him.

**Emil Gruening.**—Dr. Emil Gruening, who died May 30 at his residence in New York City, was never favored by such renown as came to McBurney, though he was largely responsible for developing the modern treatment of mastoiditis. He did not even figure in "Who's who in America" up to 1912, though he was far more entitled to it than many a man who has never done anything except have his name appear in the newspapers or some college faculty list. Gruening in addition was a veteran of the civil war, for he enlisted in the Seventh New Jersey Volunteer Infantry shortly after his arrival in this country from Prussia, where he was born in 1842. He served to the end of the war and then resumed his medical studies which he had interrupted for the patriotic duty of fighting for his adopted country. He soon became identified with eye and ear work, and has been Presi-

dent of both the Ophthalmological and Otorhinolaryngological Societies, a Director of the Eye and Ear Infirmary and member of numerous scientific societies. He was the author of articles in his special fields and deserves credit as the first to direct attention to the blindness and other damage caused by wood alcohol poisoning. Let us honor his memory with the popular renown denied him during his life.

**Announcement of the American Medicine Gold Medal Award** for 1914 is made just as we go to press. Dr. George W. Crile of Cleveland, Ohio, is the recipient this year, a selection that will be received with general satisfaction. Dr. Crile's work has attracted widespread attention both in this country and abroad, but the profession are only just beginning to realize the tremendous importance of some of his discoveries. At the recent meeting of the American Medical Association held June 23 to 27th, Dr. Crile's researches were repeatedly referred to in most flattering terms and there seemed to be a growing belief that the investigations of this brilliant young surgeon would ultimately rank in importance with those of Lister. Surely, since the principles of antisepsis and asepsis revolutionized modern surgery, no line of study has unfolded such far reaching possibilities or promised more in the direction of surgical efficiency, than Dr. Crile's discoveries concerning shock and its prevention. The formal announcement of the award will be made in our July issue by the Board of Trustees in charge of the matter, together with a brief appreciation of Dr. Crile, and a comprehensive article descriptive of his methods of producing anesthesia with complete elimination of shock.

**The Meeting of the American Medical Association** just held at Atlantic City was most successful and the friends of this great American institution will be exceedingly gratified to learn of the substantial progress that has been made in every department. The various reports covering the many activities of the Association indicated that the past year has witnessed a

large amount of constructive work that cannot fail to have a beneficial influence on medical affairs throughout the country. There probably has never been a year when the Association has justified itself more conclusively, and credit in unstinted measure should be accorded those who have been responsible for the splendid results that have been accomplished.

There is especial cause for rejoicing in that the forces of construction have been in greatest evidence this year and not those of destruction, as not a few loyal friends of the Association have been obliged to admit has too often been the case in previous years. No, the past year has been one to gladden the hearts of those who hope to see the American Medical Association become the power for good it can in promoting medical education, public health and the welfare of the medical profession. Perhaps a little broader spirit of tolerance, a little more respect for the opinions of those who honestly differ with those in power, and finally a realization that honest criticism can be expressed without animosity or ill feeling will help wonderfully in developing the interest in the work of the Association that is necessary if it is to achieve its full mission. That the good of the past year may go on and multiply, that the evils—whatever they are—may continue to decrease and wholly disappear, and finally that the American Medical Association may bring the medical men of our country to a full appreciation of their opportunities and responsibilities is the wish of every one connected with AMERICAN MEDICINE.

**Sanitary Drinking Cups for Horses.**—The Women's S. P. C. A. of Philadelphia, says a writer in the *Cyclopedia of Medicine*, proposes to do away with the common drinking bucket for horses at their stands. Each driver must carry an individual bucket to water his horses, or, to be consistent, two buckets for two horses.

This is a great modern improvement and foreshadows important future developments along this line. Meantime, thousands of babies are sacrificed annually by ignorance and neglect.



## THE MANAGEMENT OF BREAST-FEEDING.

BY

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I have already dealt somewhat fully with the details concerned in the "establishment of lactation," I now propose to consider other matters connected with its subsequent maintenance and the general management of breast-feeding up till the time of weaning.

It will be unnecessary for me to allude further to the necessity for long intervals between feeding and for giving an extended period of rest during the night, but I would refer to some very interesting observations made by Dr. Maynard Ladd<sup>8</sup> of Harvard which show that the stomach requires even a longer period than is usually supposed to become completely empty, sometimes as long as 6 hours.

The management of the quantity of milk supplied is a matter of prime importance, not so much during the first few weeks of life, when the chief desideratum is the establishment of the normal functions of

digestion, as from the end of the first month onwards when considerations of nutrition should occupy our attention.

There is a very general belief that, as the infant grows older and larger, there is a corresponding increase in the amount of breast-milk consumed, this is by no means an invariable rule, as my own observations<sup>1</sup> on a large number of infants of the poorer class very clearly prove.

There is indeed a serious risk of breast-fed infants being underfed during the later months unless precautions are taken to prevent this catastrophe.

I imagine I do not overstate the case when I say that of all the factors in the environment which make or mar the development of the infant, food or feeding is the most important. The feeding requires management, both as regards quality and quantity. It is very difficult to influence the quality of breast-milk, this is for the most part beyond our control, but we can manage the quantity or, at least, we can with very little trouble make ourselves acquainted with the exact quantity of food consumed, especially when we are dealing with infants of well-to-do parents. For many years past I have estimated by means of the "test-feed," in many cases repeatedly performed, the amount of milk consumed by all breast-fed infants brought to my clinics, both at the Queen's Hospital and at the St. Marylebone General Dispensary,

This is the second and concluding article of this series.

and by this means I have gained some experience of the quantitative variations in the milk supply of different women. These variations are so bewildering and often so unexpected that I now fully realize that it is merely playing with an important matter to attempt to treat breast-fed infants for nutritional and other disturbances until this primary element in the diagnosis has been settled. I have, indeed, had some very strange experiences which all go to show how utterly futile it is to attempt to decide this question without the confirmatory evidence of the "test-feed." Many times have I thought that the infant was being starved, when in reality it was being "over-fed," and often I have thought that "over-feeding" was the trouble when events have proved that the symptoms were due to starvation. There are indeed certain clinical tests by which we may distinguish between under-feeding and over-feeding, and I do not hesitate to refer to these very obvious aids to diagnosis, because I notice that they are systematically ignored even by practitioners of wide experience.

The cardinal symptoms of underfeeding are

- (1) Loss of weight, or at least a failure to gain weight at the normal rate.
- (2) Constipation, or in case of extreme starvation the passage of small mucous stools, and
- (3) A limited excretion of urine (oliguria).

Whereas the cardinal symptoms of over-feeding are

- (1) At first unduly large increments in weight succeeded by a period of stationary or falling weight.
- (2) The passage of large bulky stools and the presence of redness of the buttocks. Constipation sometimes develops, but the motions are large when passed.
- (3) The passage of a large quantity of water (polyuria).

- (4) Sweating and vascular dilatation of the capillaries of the face, and
- (5) Rapid breathing.

In addition to these cardinal symptoms there are other means by which we may distinguish between starvation and super-alimentation; for instance the condition of the mother's breasts conveys very important information.

Breasts which are full and large before feeding, and small and flaccid after feeding presumably afford a good supply, whereas small breasts which do not perceptibly diminish in size after feeding as a rule cannot be credited with a liberal secretion, but no matter how carefully we weigh or attempt to piece together such fragments of diagnostic evidence, it is impossible to rely on any other evidence than that of the "test-feed."

To show how very misleading the subjective sensations of the mother may be, and how utterly worthless her own opinions as to the amount of milk she may supply, I herewith give the particulars of two interesting and illustrative cases.

*Case 1.*—T. W. (Record No. 2913). A male infant 2 months old was brought to the Queen's Hospital, Feb. 10th, 1913, for continuous screaming. The weight at birth was not noted, but the baby was reported to have been of average size; the weight on being brought to the hospital was 10 lbs. So presumably the infant had increased in weight some 2 or 3 lbs. in the two months, and therefore could not have been systematically starved. For some days past the infant had been constipated, and had passed a very small quantity of water. The mother's breasts were of normal size and appeared well developed, but milk could only be expressed with difficulty. As the infant had been recently put to the breast I deferred a "test-feed" till the next visit, giving the mother instructions not to feed the infant for 3 hours before attending at the hospital. In the meantime feeling fairly confident from the symptoms that the in

fant was being starved, whatever might have taken place at an earlier date, I told the mother to give the infant 1 teaspoonful of condensed milk and two tablespoonfuls of water after each breast-feeding. Owing to a mistake on the part of the mother, it was not possible to give a test-feed when the infant was brought to the hospital a week later, but in the interval the infant had gained 2 lbs. 4½ ozs. in weight, the largest increment I have seen registered in one week; in fact no infant could possibly show such an increment unless it had been very seriously starved for some time previously. I have no doubt that the infant's tissues were very dry and that this extraordinary increase in weight was chiefly due to their re-hydration. Two days later a proper "test-feed" was given, but this showed that the infant weighed the same after the feeding as it did before it was put to the breast, a negative result which was confirmed in the following week by means of a second test-feed.

It is interesting to note that on the occasion of each of these "test-feeds" the mother told me, in answer to my enquiry, that the infant had had a good feed, and that she felt sure it obtained quite as much as it had during the early days of life when it was making good progress, and did not scream.

Seven days later another "test-feed" was given but the result still proved that the breasts were dry. In the interim, however, the infant had gained further weight and was now 13 lbs. 4 ozs. The mother was apparently so satisfied with the result of the artificial feeding that she ceased her attendance at the hospital and I have not seen the infant since.

This result illustrates one of the great dangers of supplementary feeding with condensed milk; owing to the sweetness of the milk the infants take so kindly to the food that they do not seem to apply much energy to the task of obtaining milk from a relatively dry breast. Moreover, the mothers are so pleased with the immediate results, that they are only too glad to relinquish breast-feeding with all its attendant troubles and

disappointments. I have very little doubt that the infant above referred to grew into a fat, contented, flabby and unhealthy baby, like the rest of its kind who are fed on this most unsatisfactory food.

I have great faith in condensed milk as an easy stepping-stone to better things, but as a permanent bridge between the period of early weaning and the solid food stage, it is full of temptations and dangers. The three main faults in condensed milk, at any rate the ordinary sweetened variety, are (1) that it contains a great excess of sugar, (2) that it is too easily digested and does not develop the functions of digestion and (3) that it is a dead food which contains no antiscorbutic elements (vitamines).

The following case illustrates the value of the "test-feed" from a totally different point of view.

*Case 2.*—W. W. (Record No. 3340). A male infant 6 months old and weighing 16 lbs. 6 ozs. was brought to the Queen's Hospital for constipation and glands in the neck. The infant was fed every two hours and the mother was under the impression that she had not sufficient milk. I gathered from the mother's account of the condition of the napkins that the infant passed a large quantity of water, and from the appearance of the breasts and the ease with which milk could be expressed, I felt convinced that from whatever else the infant might be suffering, its present condition was not due to want of milk. I gave the mother the usual instructions and two days later a "test-feed" was given at the hospital; this proved that the amount of milk which the infant extracted from the breast was very nearly seven ounces, a quantity which in my experience of hospital practice in the East End of London is a record amount. This infant was clearly suffering from over-feeding, and on reflection the symptoms appeared to be by no means inconsistent with this explanation. Constipation is not an uncommon accompaniment of super-alimentation, but in this particular case, as I subsequently discovered, the constipation was due to the abuse of soap-and

water enemata. As I so frequently point out at my clinics, there are few more aggravating causes of constipation in infants than the early dislocation of the normal rectal reflex by the administration of enemata, glycerine suppositories and powerful aperients. I treated this case by extending the intervals between feeding, by reducing the amount of clothing and by promoting the physiological demand for food in the many ways I have already mentioned. Thus I overcame the evil consequences of over-feeding and the infant soon improved in condition. It at once put on weight and was in perfectly good health when the mother ceased attending at the hospital.

I could easily multiply instances both of over-feeding and of under-feeding which have been revealed and cured owing to the instrumentality of the "test-feed," but no degree of repetition would be so convincing as a short experience of the method in an infant clinic. Personally I cannot understand how any physician can expect to treat breast-fed infants successfully unless he first takes the precaution of acquainting himself with the amount of food the infant consumes.

I imagine that the two really important factors in the infant's environment are the quantity and the quality of the food. It is very difficult to obtain accurate information with respect to the quality of breast-milk, for chemical analysis shows us but little, but it is quite easy to obtain precise information with respect to the quantity, and I consider that any physician who fails to take this precaution, does not do his duty by his patient.

Although for the last 10 years I have practically never omitted to gauge as accurately as I have been able, the amount of milk which has been consumed by every breast-fed infant concerning whom I have been consulted, I freely admit that even

with this experience I am unable to form a reliable estimation by any clinical test with which I am acquainted except the "test-feed."

I have elsewhere explained that, within certain wide limits, the supply of breast milk is correlated to the demands of the infant, that is to say, other things being equal, the more hungry and lusty the infant, the larger will be the amount of milk afforded by the breasts, in other words there is some parallelism between the intensity of the stimulation and the reflex response. But this physiological correlation does not obtain under all conditions, its fulfilment demands the existence of normal conditions in the secretory apparatus and its nervous mechanisms, a very large assumption. For instance the casual presence of a crack in the nipple may induce painful impressions, instead of normal stimulation, and such painful impressions may suppress rather than excite secretion in the mammary glands, or psychological disturbances in the mother may interfere with the normal liberation of the reflex response. Again, the infant itself is, like the mother, subject to psychological disturbances, and for some quite unforeseen reason may refuse to suck and apply the required stimulus. Suggestion plays a most important part in the actions of an infant. For instance, one or two disappointments at the breast may shake its faith, and it may refuse to make what it considers to be wasted efforts. Or again, sometimes the effort of sucking may initiate painful sensations in the abdomen, due to spasms or contraction of sphincters or muscular bands; enterospasms and other varieties of incoordinated peristalsis often cause excruciating pain, and when once the infant associates such experiences with the act of

taking the breast, it may resolutely refuse to be a party to any repetition of the attempt.

The truth is that breast-feeding requires a great deal of management if it is to be a complete success. It is a mistake to underrate its difficulties or to exaggerate its merits.

One of the most important matters in connection with breast-feeding is to know when and how to supplement an inadequate supply with artificial feedings. In this connection two factors must be considered. Firstly, how much food ought any particular infant to receive in the 24 hours. And secondly, how much does it actually derive from the mother's breasts. As regards the first factor I must refer to what I have already said in my lecture on the quantitative requirements of infants. If it is found by means of the test-feed that the quantity of milk supplied by the mother falls materially short of this amount, then the deficit must be made good by supplementary feedings. It is very difficult to increase the natural supply of any expedient known to science although plenty of gratuitous advice is always forthcoming from amateur sources.

Galactogogues which directly stimulate the flow are unknown, and food makes very little impression. Starving women afford quite a good supply as we know from the experiences of the Siege of Paris in 1870, and the great cotton famine in Lancashire some years prior to this date. On both of these occasions the infant mortality was peculiarly low, the infants benefitted rather than the reverse from starvation of the mothers. I had an interesting illustration of the insignificant influence of starvation on the mother's milk a few days ago, when a woman, whom I had known for some years, came to my infant consultation with

a 3 months' old baby whom she was sucking. This woman was seriously suffering from the effects of inanition, and yet the baby was plump and well, increasing normally in weight, and appearing quite well in all other respects.

The test-feed showed that the amount of milk obtained at a feeding was ample. Dr. Leslie Duncan<sup>2</sup> has made some interesting observations on the influence of dinners supplied to necessitous nursing mothers in Birmingham. The extra food supplied in this way to half-starved women had a distinct influence on the fat content of the milk, but in no other way appeared to influence its quality, although the nutrition of the mothers materially improved in consequence of the extra food.

This has been my own experience also, although I have not had an opportunity of confirming my clinical experience by many actual analyses of the milk.

On the other hand, if a nursing mother is already obtaining a sufficiency of food, no good purpose will be subserved by amplifying her already adequate dietary. Nursing stout, gruel and cod liver oil often do more harm than good by making the mother bilious and thus upsetting the general bodily equilibrium on which a good mammary secretion so largely depends: I would, however, say one word in favor of iron as an adjuvant to the nutrition of the nursing mother; it is certainly a drug which may improve the quality of the milk. At the best of times breast-milk is not too rich in iron, and it may show a noticeable deficiency if the mother has been depleted of iron by hemorrhages or other conditions which dispose to anemia. Infants very soon show the effects of iron starvation, and their general condition of nutrition may under certain circumstances greatly improve when

iron is administered to the mothers. I make a common practice of supplying nursing mothers with 15 to 60 grains of carbonate of iron in the 24 hours, and I generally notice that the quality of the milk—as estimated by the nutrition of the infants, improves. Seeing that by ordinary means we cannot increase the quantity of the natural supply, we must compensate for a shortage of breast-milk by giving supplementary feedings; and it is certainly my experience that some of the best results which I have seen have been in the case of infants fed by the combined method. The supplementary feedings can be given in various ways, either at the beginning or at the end of a breast-feeding, or as an occasional substitute for it, that is to say by alternating breast and bottle-feedings, or by substituting 1, 2, 3 or more bottles for the breast.

I would not like to lay down any hard and fast rules. Each case must be judged on its own merits. Sometimes on enquiry, or in consequence of a test-feed, we find that at one particular hour in the day the mother's milk materially fails. If this is so, this hour should be chosen for the supplementary bottle—I find from experience that the late afternoon feeds are the poorest in quantity, just as the first morning feed, after the long rest at night is usually the largest.

Sometimes I find it an excellent plan to give a small supplementary feed at the end of each feeding. I have had some very extraordinary cases both at the Queen's Hospital and at the St. Marylebone General Dispensary, in which the addition of an insignificant quantity of extra food has produced quite a disproportionate change in the infant. Infants whose weight may have been stationary for weeks or months

may increase a pound or more in weight in quite a short time by the addition of a few ounces of cow's milk in the 24 hours.

It is naturally of some importance to supply the right food in the right amount when recourse is had to supplementary feedings. The amount of food to be given by hand will depend on the quantity of breast-milk already taken by the infant. It is unwise to augment the quantity too suddenly or too drastically. The danger of overloading an unprepared stomach is very great.

If an infant obtains say 15 ozs. of breast-milk from the mother in the 24 hours, when according to theoretical estimation the amount should be 10 ounces more, we must consider in what way to supply the deficiency. If we find after giving a few test-feeds that sometimes the infant obtains a large quantity and sometimes a small, it may be quite safe to give the supplementary food in comparatively large quantities, say in doses of 3, 4 or 5 ounces. On the other hand if the infant appears to obtain its total supply in small and constantly regular quantities, it may be better to distribute the supplementary food in the form of small and increasing addendums to each feed, but as I say, there is no rule, and each problem must be solved by individual consideration of the attendant difficulties.

I find among the poor that the simplest and most practical method of supplementing a defective breast supply, is to order a quarter, a half or a whole teaspoonful of condensed milk to be given after each breast feeding, the food to be given in a spoon without any previous dilution; this obviates the possible danger of overdistending a stomach already full of a thin and poor milk, for it must be remembered that, infants are often underfed, although the quantity of breast-milk may be ample. This

is especially the case towards the end of lactation, when the mother has become exhausted from prolonged suckling and the milk becomes thin.

I feel in this lecture that I have omitted a great deal that ought to be pointed out in any complete account of breast-feeding, my only defence for these omissions is that I have thought it advisable to husband time and space and confine myself as far as possible to those sides of the question which are generally omitted in text-books and other works dealing with the subject.

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## THE IMPORTANCE OF A DISCIPLINED MIND.

BY

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The disciplined mind has ever challenged the admiration of the world. All that science, art, literature has given us can be traced to the one who has been trained to accomplishments by study, close attention to details in the building up of that character which was sooner or later to give evidence of the disciplined mind without which it indeed is rare the master mind exists. It is true that the world has been brought

face to face with genius, rare accomplishments in those whose previous habits and training had not promised such. But these are rare instances, and only serve to prove the rule that great accomplishments are due to previous training. The trained, disciplined soldier, scholar, diplomat, artist, writer, surgeon, orator, inventor has been the one who has made history and advanced humanity. It will be my purpose to cite a few illustrations showing the value of discipline at critical periods. They will be selected at random and have no connection one with another.

A few years since a noted surgeon of Chicago, a man past middle age, was performing an operation, his assistant being his son, also a surgeon. After the abdominal wall had been opened and some necessary dissection made, the operator was suddenly stricken with heart failure and fell lifeless at the side of the operating table. The son, who was on the opposite side assisting, on the instant noted a complication which meant immediate death to the patient unless at once attended to. With one glance at his stricken father he was convinced that death had come instantly and without warning. He proceeded to correct the alarming condition of the patient while the nurses carried the beloved father into an adjoining room. The work was soon finished, but with a clear head, steady hand and the true instinct of the well trained surgeon. Not until then did the grief stricken son again look upon the face of his beloved father. There is no doubt that numbers of cases could be cited of an equal presence of mind and entire devotion to the work in hand relegating for the time self to obscurity in the interests of the patient whose life was largely in his keeping, but it must be admitted that this case showed a perfectly disciplined mind, a mind, con-

science and purpose resulting only from years of careful training.

Another and widely different character of effects of discipline refers to an episode which also took place in Chicago during one of their railroad strikes, some time in the late eighties.

The state being unable to maintain order and prevent rioting with destruction of life and property with the militia, asked aid from the government. Regular troops were sent to the city with full camp equipment. A number of these, including light artillery, were encamped on the lake front. There were anxious days, nights when law-abiding citizens kept within their own homes, for the city was crowded with highwaymen, burglars, torch bearers and the undesirables from all over the country who flocked to the stricken city in the hope and expectation of bettering their fortunes. During the tedious days in camp it became necessary to give the men as well as horses belonging to the cavalry and artillery more exercise than the confines of the camp offered. This was done by relays, two or three guns with full equipment of ammunition and escorts being sent upon the nearby streets in charge, usually, of junior officers for an hour's exercise. Upon one of these occasions such a detachment was parading up and down Michigan avenue in charge of a second lieutenant, a recent graduate of West Point. The gun carriages were equipped with cartridges, the men with their full quota of arms. Usually people, good and bad alike, lined the sidewalks to view these exercises. The strikers had scouts all over the city watching the movements of the soldiers especially in the neighborhood of the camps. As there had been attacks made upon the soldiers by ruffians, some shots fired from the crowd, every precaution was taken to

avoid surprise by a keen watch of all gatherings. Upon the occasion under discussion while the artillery were passing along the street, suddenly and without warning some of the cartridges in a gun carriage exploded. Several artillery men were killed, others wounded. Instantly there was the wildest confusion both among the citizens and soldiers. An ugly look came into the eyes of the mounted escort as they prepared to charge the crowd, and were with drawn sabers upon the point of doing so when the officer in command, the young, beardless youth, the second lieutenant above mentioned, realizing the danger of the situation shouted, "Attention! Steady! Steady!" Every one of the battle-scarred veterans, many with long service and old enough to be father of the officer, came to a standstill and close attention, most if not all of them expecting to hear the command to charge; but it was rather one to "dismount, alternate numbers and attend to the wounded." The fear of the citizens was quieted and bloodshed, death of innocents avoided, while discipline, masterful and complete, reigned. A mighty shout from those on the sidewalk greeted the soldiers. Hats were removed as the procession returned with their dead and wounded to camp.

Another impressive incident occurred of a peaceful nature some few years since at West Point when the diplomas were being given the graduating class, and although not a word was spoken, was most impressive to the spectators. The Secretary of War, if we are not mistaken, was present to make the address and deliver the diplomas. Among the Army officers present to witness the presentation was Gen. Chaffee. He who had covered himself with such distinction in China during the Boxer disturbance as well as during his previous

career. It will be remembered that Gen. Chaffee, like Gen. Nelson Miles, rose from the ranks, having enlisted in the army at the beginning of the Civil War as a private. Neither Gen. Chaffee nor Gen. Miles therefore, ever attended the Military school at West Point or were the recipients of the coveted diplomas. In the class at the time of which we write, Gen. Chaffee's son was in line to receive the vaunted prize, the paper making him an officer in the United States Army. In that army in which his revered father had so distinguished himself as to rise by merit from a private to the Commanding General of the whole army. That father upon whose knees he had sat, around whose neck his arms had so often entwined in loving embrace when yet a child and whose sole ambition was doubtless to emulate that loved parent. When the young man's name was called to step out of the ranks and receive his diploma, the Secretary of War, Mr. Taft, our Ex-President, I think, handed the document to Gen. Chaffee to give his son, a very courteous and friendly act. The young man stepped in front of the General, saluted, and after an instant's intense look into each other's eyes, was handed the document, not a word being uttered by either father or son. Doubtless each wished in his heart that he could take the other in his arms for just one short moment; have whispered a few words into the ear of the other, words never to be forgotten while life lasted, but each had been disciplined to the calling of war. It was said that suspicious winking of eyes was indulged in by the young man after his return to the ranks of his comrades and that the grand old warrior, that battle-scarred veteran, the hero of many desperate fights, he who had unmoved looked upon the dead and dying,

was compelled to clear his throat several times immediately afterwards. In the privacy of their home that night—well, that is another matter.

We have next to relate some incidents in the career of that genius of war, Napoleon Bonaparte.

We read in the history of Napoleon that at the battle of Wagram the legions of France had been hurled back time and again by the terrific onslaughts of the Austrian hosts. With that marvelous pre-science and genius for war the Emperor Napoleon realizing that his sole hope of achieving a victory if not, indeed, the saving of his army from utter defeat, was to pierce the Austrian center, summoned MacDonald and commanded him to accomplish that task. It will be remembered that there was, if not bad blood, at least unfriendliness between Napoleon and MacDonald, angry words having passed between them the day before. MacDonald was the one man for the deed, however, and relying upon that fealty and discipline which ever prevailed among his army, Napoleon gave the order. MacDonald without a word of reply put himself at the head of his veteran corps of fifteen thousand men, his form towering and erect as if a gigantic Titan about to execute the commands of a Deity. His face took on the aspect of determination; his eyes lighted with the battle's lurid glare, while every fiber and nerve was like that of the Numidian lion when roused; while his old heart has filled with a soldier's stern resolve to save the Empire or die; and the awful charge began. Across the field was heard the shout and tramp of the mighty Austrian army from whose front and flanks came the roar and shrieks and screams of guns. On MacDonald goes; now men fall;

the ranks fill up and others fall to die; groans are heard, piteous cries of pain are mingled with curses and calls to God and the rattle of musketry; battle flags are torn, captured and recaptured; hands that hold them to view are black and bloody. But still MacDonald moves on while that solitary figure sits his white steed secure in his General's ability to effect his purpose and of his soldier's willingness to die with the battle cry "Vive l' Empereur," still on their lips. There is no time to look back upon the trail of blood and dead and dying men; but one stands where ten stood before. "Vive l' Empereur" is mingled with curses and "oh, God!" Far to right and left Austrian guns roar while Arch-Duke Charles tries to close up the awful gap being made in his army. "On!" roars MacDonald, the man of iron, and through the rain of shot, death dealing saber thrusts, fumes of sulfurous smoke, through shouts and din and belching tongues of fire, through living walls of flame and crimson rivulets of blood, MacDonald leads and his immortals follow straight into the jaws of death; right to the mouth of hell. They strain and storm until at last with a tremendous shout which was carried to the man immobile, with eyes intent and muscles tense, sitting like the God of War on the white horse, perfectly understanding the import of that battle cry, the line is pierced and almost certain defeat turned to victory.

When the Emperor gave one hand to the black and bloody MacDonald to grasp and with the other presented a Marshal's baton, this grand old man, this soldier of soldiers, shed tears and forgot his anger towards his Emperor.

At the battle of Waterloo, as is well known, the fortunes of war were with the

allied troops. The battle had waged all day and every expedient used by Napoleon to defeat his enemies. Corps and battalions had been hurled against Wellington's men, but with no enduring success. All this time the old guard had been held in reserve; but toward evening, when it seemed the battle would be lost, Napoleon called from the field where he had been throughout the day in the thickest of the fight, that great Captain, Marshal Ney, and commanded him to assemble the Old Guard and storm the enemy in an endeavor to break his line. It was a forlorn hope, but as such it must be made. If anything could be done it was Ney and the undefeated veterans, undefeated in years of desperate fighting; those men who had never failed him, upon whose loyalty he was willing to stake his all; Empire, life. Napoleon, mounted upon his white horse took a position where the Old Guard would pass him in review, and as they came thundering past said not a word, but like a statue pointed with his sword the way to the enemy. It was not necessary to speak; they understood, and each man was willing, aye, anxious to go into that boiling, seething hell to die if need be, if through his death victory could come to his beloved Emperor. As they rushed past there arose a shout that it would seem might have stricken terror to the forces under Wellington. But Wellington himself was on the field, and his men were true Anglo-Saxons, only such as ever trailed the banner of France while under Napoleon in the dirt. As is known the charge was turned into a rout, to utter defeat and the glory of the Immortal Old Guard was ended. Throughout the night the wounded and dying could be heard shouting "Vive l' Empereur," while at times there came groans, curses, prayers. Even

after his utter defeat Napoleon sat looking towards his enemies until Marshal Ney was compelled to turn the white horse away from the battle in order to save his Emperor, whose star had set, while perhaps the best disciplined troops of history, the invincible Old Guard, had at the word of command of him they loved as a father gone to what they doubtless realized as certain defeat.

One more incident of discipline and we are done. The elder Booth, Junius Brutus Booth, was, as is known to students of the stage, one of the greatest of our tragedians. Many extraordinary stories of his eccentricities have been told, many of them doubtless true. Among them it is related that he was much given to drink and that through this, a confirmed habit, he upon occasions seriously embarrassed his managers in that he could not keep his engagements. Upon the occasion which we are about to relate he was playing in Louisville, Ky. Among other plays he was announced to give Shakspere's "Richard III" on a certain night. He played the previous nights of his engagement without interruption, but on the morning of the day set for Richard III he failed to appear at a rehearsal called by himself. But this, while causing some apprehension, was not regarded as serious until during the afternoon when the manager of the theater called at his hotel, the Old Gault House, to learn that Mr. Booth had not been seen since the night previous when he had left for the theater. A search was at once made, but no tidings returned to the theater. Night came on and the supporting company assembled to dress for the performance. Half past seven and no word had been received from the star. Other

messengers were sent out to visit all places where liquor was sold, with instructions to bring Mr. Booth to the theater if found, regardless of his condition. Eight o'clock and the audience becoming impatient, the manager stepped before the curtain and informed them that Mr. Booth had been delayed but that he expected him to arrive within a few minutes. At eight fifteen a carriage arrived at the stage entrance. Two of the theater attaches helped Mr. Booth out and carried him into his dressing room senseless and helpless from intoxication. A council was held and the manager finally decided to place the blame upon Mr. Booth for disappointing the audience rather than to return the receipts and send the people away with a false excuse. So he gave instructions to dress Mr. Booth in the costume he wore for the first part of Richard, while he again went before the curtain and announced that Mr. Booth was present and the curtain would go up in a few minutes. When the tragedian was fully dressed for the part a couch was rolled out upon the stage and Mr. Booth placed upon it, reclining upon his side facing the audience, soundly asleep. When all was ready the stage manager rang his bell as a signal for the curtain to be hoisted. The tinkling bell and the sound of the rising curtain aroused Mr. Booth, who opened his eyes and looked at the audience. The unusual sight of the man on the couch caused murmurs from the front of the house, and this further aroused the actor. He raised himself upon his elbow, viewed the audience and the stage, saw the support fully accoutered for the performance and whispered to the stage manager "What's the play?" Was told "Richard III." In a few moments he began the soliloquy of Richard:

"Now is the winter of our discontent  
Made glorious summer by this son of  
York," etc.

By the time this somewhat lengthy speech was ended, Mr. Booth was on his feet and finished the play much to the delight of his audience, who in all probability went their several ways home debating the unusual manner in which the play had begun. This must surely be regarded as a severe test of the trained, disciplined mind.

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## LOGIC AND ANTI-PSYCHOANALYSIS.

BY

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One whose spirits get ruffled when his mental workings are anatomised ought to "beware of entrance in a quarrel." A controversialist, especially one who aspires to lead the vanguard in an onslaught on "the isms" (all the isms, of course, including Darwinism, heroism, criticism, optimism, magnetism, etc.) must be prepared to have his inadequate scientific attainments, his misrepresentation of his adversary's cause, his misunderstanding of what he is assailing, and his logical weaknesses pointed out, yes, and—if need be—his motives questioned. (Psychoanalysts are quite accustomed to being told that they practice psychoanalysis because it pays. Would it were so!) These reflections occur to me after reading Dr. Meyer Solomon's rejoinder in the *New York Medical Journal*, May 9, 1914, to a paper of mine replying to one of his attempting to reduce the theories of Freud and his school to an absurdity. Before I proceed to consider his attempt to support his original position

I wish to assure him that my only motive is the establishment of the truth, that there is nothing "personal" in my analysis of his arguments, and that I consider the question of the truth or falsity of the Freudian teachings of far greater importance than the sensibilities of any individual or group of individuals. If, however, Dr. Solomon feels himself personally aggrieved, I say to him, as Hamlet did to Laertes: "in this audience, let my disclaiming from a purposed evil free me so far in your most generous thoughts, that I have shot mine arrow o'er the house and hurt my brother," and that I consider this debate between us only as a brother's wager which must, for all that, be frankly fought. In perfect honesty I must therefore set it down that I retract nothing from my reply to him except that the statement that he differs from other "opponents" of psychoanalysis in the desire to learn the truth. To my great chagrin I learn from his later contribution to the discussion that his questions in the former one were only "rhetorical" and were not intended to elicit information. And when, to my still greater chagrin, I learn that he characterizes his own questions as "absurd" (p. 925), I can only exclaim: "I was the more deceived!"

Dr. Solomon asks this time, not "rhetorically," I hope, "if my conclusions are wrong, why are they wrong?" The answer is simple: because he employs language very carelessly (which he admits "for a moment"); because he has "only little knowledge of the subject" of Freudian psychoanalysis (which he admits "for the sake of argument") and, what he does not admit, but what I'll prove, that he does not reason logically. He says (p. 925): "Jones believes that dreams are the neuroses of the healthy; and Freud believes that neuroses are the negative of sexual perva-

sions; hence *all dreams are the negative of sexual perversions.*" Let us first note that Dr. Solomon's conclusion speaks of "all dreams" although Jones speaks only of the dreams of the healthy, for obviously he could not have meant to say that the dreams of the neurotic and of the insane, etc., are the neuroses of the healthy. Let us now analyse Dr. Solomon's syllogism:

- (1) (Jones) Dreams are the neuroses of the healthy.
- (2) (Freud) Neuroses are the negative of sexual perversions.
- (3) (Solomon) Dreams are the negative of sexual perversions.

Let us assume that Freud is willing to accept Jones's statement *in the sense that Jones intended*, and that Jones similarly accepts Freud's statement. To one who has had even only a smattering knowledge of the principles of logic it is at once apparent that Dr. Solomon has committed the "fallacy of accident." He has taken Jones's metaphorical expression literally, he has misinterpreted Jones. What Jones meant, as anyone may see who will read his brilliant essay on "The Relationship between Dreams and Psychoneurotic Symptoms" (*American Jl. of Insanity*, July, 1911), was that from a certain viewpoint (i. e., as being the expression of repressed desires and as being wish fulfillments, etc.) the dreams of the healthy may be said to be their neurotic manifestations, i. e., that *dreams of healthy persons share certain characteristics with the symptoms of neurotics*; but he did not say that healthy persons are neurotics, although from a certain point of view it may be said that there is something "abnormal" even in the "normal" (just as it has been said that there is a streak of insanity in all of us).

In the second premise Freud employs the term "neuroses" to mean the diseases known

as "psychoneuroses" (apprehension hysteria, phobias, obsessions). Jones's "neuroses of the healthy" is not the equivalent of Freud's "neuroses," and we therefore have a syllogism without a common term (cf. any book on logic) and therefore no valid conclusion can be drawn from Dr. Solomon's premises. To make this perfectly clear to Dr. Solomon and to anyone having any trust in his reasoning, let me give these parodies of his syllogism: 1. Love is the salt of life; salt is the chloride of sodium; hence, love is the chloride of sodium; 2. The camel is the ship of the desert; ships are made of wood and iron; hence, camels are made of wood and iron.

Our opponent's stock argument, of whose repetition, in various shapes, he never wearies, is the following (p. 922): "If hysteria is based primarily on sexuality alone, then every possible dissociated state, e. g., a state of distraction, dementia precox, etc., is dependent on sexuality." By the "etc." in this sentence our learned opponent means, as he tells us on the same page, "states of abstraction, day dreaming, hypnoidal states, hypnotic states, hypnagogic states, sleep, states of relative mental relaxation, and many (other) mental states of allied nature." Then, on page 923, we are cautioned ever to remember "that all these conditions (i. e., neuroses, psychoneuroses and psychoses) merge into one another by imperceptible series of gradations, and that they differ from each other especially in the degree of the relative admixture of somatic and psychic symptoms." This then is Dr. Solomon's trump argument when stripped of columns of irrelevant verbiage which tends only to confuse the issue. Whether true or false his argument must be susceptible of being reduced to a syllogism, and in order to test its validity we

shall proceed to do so.

It is evident that our opponent wants to prove that if his version of the Freudian theory of hysteria is true it must follow that *states of abstraction, day dreaming, hypnoidal states, hypnotic states, sleep, neuroses, psychoneuroses and psychoses are due to sexuality (alone)*. This, then, is the conclusion of his syllogism. His major premise is that *hysteria is based primarily on sexuality alone*. Anyone acquainted with the principles of logic knows that, these sentences being the major premise and the conclusion, the minor premise *must* be this: *states of abstraction, day dreaming, hypnoidal states, sleep, neuroses, etc., are degrees of hysteria*.

Let us now examine this syllogism. A syllogism is no syllogism if the major and minor premises do not contain a common term or point of comparison between the two premises, which in the present argument must be "hysteria." Of course Dr. Solomon did not say specifically that "sleep, neuroses, psychoses, etc., are different degrees of hysteria;" he said only that they *differ in degree* and did not specify in degree of what. On page 922 he does say that these mental states differ "in degree of consciousness," and on page 923 he says that they differ "in the degree of the relative admixture of somatic and psychic symptoms." Obviously neither of these points of comparison can be used in a syllogism whose major premise and conclusion are those given by Dr. Solomon. If we attempt to substitute either of these for the term "hysteria" in the major premise we get the following: "Consciousness is based primarily on sexuality alone," or "admixtures of somatic and psychic symptoms are based primarily on sexuality alone." But neither of

these two propositions can be employed as the major premise because neither is a belief or tenet of the Freudians; and, furthermore, neither can be employed as the major premise in the syllogism because they already state Dr. Solomon's conclusion—in other words they would beg the question.

Let us now turn our attention to the minor premise: "states of abstraction, day dreaming, sleep, dreams, neuroses, psychoses, etc., are different degrees of hysteria." (Dr. Solomon does in fact say: "All of these, as well as dementia precox, have a distinct relation to hysteria," and "all these conditions are states of mental dissociation.") The objection to this proposition is that it is not true in fact. Though there are many points of resemblance between these different mental states *the points of difference* between them are their characteristic features and enable us to distinguish them from one another. If they differed only in degree we should not give them separate names and consider them as different entities. (The pathological workings of the human body differ from normal physiological activity chiefly in degree, and yet we have many various disease entities each of which presents a definite picture). Furthermore, when things differ from each other quantitatively they very often come to differ qualitatively (e. g., calomel and bichloride of mercury, water and hydrogen dioxide, the carbohydrates, the alcohols, etc.). Besides, it remains yet to be proved whether all mental dissociations are produced in the same way or are due to the same causative agent or are the same in essence. And, furthermore, the same causative factor, with various modifications, may lie at the basis of different kinds of mental dissociation, just as certain elements may be the sole ingredients of a large number

of different substances, and just as the attraction of gravitation may be the cause of very different phenomena.

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## MEMORIAM OF A MEDICAL PIONEER.

BY

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All life insurance companies are confronted with fraudulent claims for injuries, and efforts to secure death payments that are unjust and dishonest. Their success depends very largely on the skill and judgment of medical men in preventing the insurance of bad risks and the payment of fraudulent claims.

Notwithstanding the most rigid rules and efforts to avoid danger from this source, all companies have lists of doubtful claims pressed with great vigor for settlement.

Each company has its own standards which depend on the medical advisers and a more or less exact knowledge of the conditions.

After the Civil War a new interest sprang up to secure protection from life and accident companies, and this brought in greater obstacles requiring more exact forecasts of individual life and its expectancy.

The Travelers Insurance and Accident Company was among the pioneers and brought new interest to the problems. The actuary could predict the possibility of accidents with considerable certainty, but the medical man was called on to determine the nature of the accidents, and this called

for the highest specialized talent and medical skill.

The issuing of accident policies at railroad stations and all over the country, those that cost from 25 cents upwards, attracted large armies of disreputable men who laid claims for injuries from all sorts of accidents and disabilities. Plots and ingenious swindling schemes were projected to force the company to pay, and even some physicians were drawn into these schemes and assisted in efforts of the most disreputable character.

Several of the early companies were forced to suspend. The claims department was so much greater than they had anticipated, that they were practically bankrupt.

At this time Dr. J. B. Lewis appeared as the medical director and adjuster in the Claims Department of the Travelers Insurance. He was born on Long Island and graduated in 1853 from the New York University, went into the Civil War as a surgeon, and came out four years later as a medical director, with a fine reputation as an executive officer in both field and hospital service.

He engaged in private practice until 1868 when he became connected with the Travelers Insurance Company. From this time on until his death in 1914 he has been in continuous service.

Dr. Lewis was literally, the most widely known man, not only in insurance circles, but among medical men and surgeons who had to do with insurance interests.

He early showed a remarkable skill, in medical and surgical diagnosis combined with a rare judicial temperament for arranging facts and passing upon them with fairness and justice to all. Before insurance companies had been so thoroughly organized, it was necessary to make personal

examinations of disputed questions on the ground, and among the men who claimed to be injured. In this, Dr. Lewis showed a rare analytical mind and a detective ability to reason inductively and deductively, concerning the meaning of facts and conclusions.

Medico-legal matters were not so well known in those early days. Laws and rulings were conflicting and testimony was not so carefully scrutinized as at present. A new jurisprudence had to be worked out, particularly along surgical lines, and new claims and possibilities had to be discriminated and tabulated with some sort of reasonable order and justice. He seemed to be particularly adapted for this work. Instead of sitting in a central office, studying data and conclusions, and the results of correspondence, Dr. Lewis went out to the claimants and made personal examinations, studied the physicians who had certified to the claims, made notes of all the surroundings, the conditions; went into the family history and all the vast range of probabilities that would give influence and color to the motives and purposes of the claimant. This was done in a most quiet, unofficial way, and often with concealed identity.

Surgeons who thought they were very familiar with all the facts medically and attorneys who were positive they had gathered all the legal data concerning the case, were overwhelmed with astonishment to find superior information, both medically and legally, and more exact deductions. Many of these men underestimated the bland medical adjuster and supposed his knowledge was only theoretical and by no means as exact as their experience. In reality they recognized a master surgical skill and diagnostic conception of what

would follow, grouped with detective accuracy and clearness.

Medical men who had lent themselves to the promotion of fraud, realized that their conduct and motive was understood and their responsibility was known to the medical men of the insurance company, also that they were liable, and had seriously compromised themselves. Wherever they attempted to evert the consequences, they found Dr. Lewis sympathetic, kind and generous and not disposed to take advantage. Thus year after year this quiet, genteel soft-spoken man traveled about the country unobserved, calling at doctor's offices, sometimes making himself known, at others in quest of information and at all times and on all occasions, asking questions, giving no opinions or judgment on affairs that he was interested in.

Medical experts, who supposed that they were better judges than others on medico-legal questions were astonished that the company did not employ them, and that when the trial came on a more comprehensive study had appeared than they had made, also that the facts the company possessed in relation to the matter in question, were far more exhaustive.

Dr. Lewis was a wonderful judge of human nature, and remembered the little incidents and surroundings of thousands of people whom he had met, and was able to refer back to many long forgotten events that might suddenly come into question.

He observed very closely and made frequent notes and estimates of physicians and their work, knew all the new text books on surgery and marked all the possible questions, that would come into the work of accident insurance. In this he was literally a pioneer, marking out a medical jurisprudence in life and accident insurance mat-

ters that has been influential and serviceable to all other companies, and will be in the future.

He was rarely seen in medical societies; occasionally he read some article on disputed points and death claims, and wrote a book giving graphic statements of shrewd efforts to swindle companies.

The medical work of these companies is divided among a large number of doctors in each, who become especially skilled in the study of certain claims, and thus the companies' interests are protected.

Surgical injuries constitute a large part of the claims that come to the accident companies, and this calls for the highest



DR. JOHN B. LEWIS.

He read medical journals freely and knew all the possible changes that were likely to alter the practice. The magnitude of the business of the accident insurance alone is simply enormous. Over half a dozen companies with immense capitals and most thoroughly organized systems of work are carrying on this business with many more smaller and less known companies.

kind of surgical prognosis and diagnosis growing out of the alleged facts. The ordinary diagnosis of an expert surgeon, while very valuable, would fall far short of fully realizing the exact conditions which these expert physicians work out.

Such studies when passing through the scrutiny of these medical examiners appear quite different and experience often con-

firms the judgment of the examiners. It is to the interests of the company to be just and fair but there is no sympathy or sentiment in their study of the facts.

It was this technical jurisprudence that Dr. Lewis built up and made possible by his almost marvelous skill of discernment, knowledge of human nature and familiarity with the events of life.

Now that electricity and new motor powers have become so very prominent in the activities of the world, the surgical diagnosis and the medical studies of results from the most complex injuries, become far more complex than ever.

It will be new to many physicians to know the attainments of the medical men connected with these companies and the most difficult problems that they are constantly called upon to determine in both life and accident departments.

It is to the interests of the company to avoid publicity in the study, discussion and settlement of claims, hence medical journals and medical literature have very little to say about these very conflicting questions. When they do appear in literature, it is only a brief outline and very little detail of the exact painstaking work that has grown up around these claims.

Dr. Lewis left very tender memories among his associates in both companies and in the medical profession where he was known, but beyond this, he organized a system of jurisprudence and exact study which has materially changed the progress of both accident and life insurance companies in the last decade.

In cases of anemia or faintness without other apparent cause, inquire concerning the passage of black stools. This condition may be the result of an ulcer or a neoplasm of the small intestine.—*Med. Summary.*

## SOME REMARKS ON HUNTINGTON'S CHOREA; WITH GENEALOGICAL AND CASE HISTORIES OF A FAMILY OF CHOREICS.<sup>1</sup>

BY

EDMOND J. MELVILLE, M. D., C. M.,  
St. Albans, Vt.

Dr. George Huntington of Pomeroy, Ohio, in the *Medical and Surgical Reporter* of April 13, 1872, was the first physician to describe this affection and give it a separate entity. The disease had been studied by himself, his father and grandfather and has apparently been confined to a few families in the eastern end of Long Island. It never attacks the patient until after middle life, is always inherited and should one generation escape the malady, it does not develop thereafter unless a member of a succeeding generation marries a person inheriting the disease. It comes on gradually and takes years to develop, but when once established yields to no form of treatment. In most cases there is a marked tendency to dementia in the later stages of the disease, and in the cases which the writer has had an opportunity to observe, paralysis of the voluntary and involuntary muscles and extreme restlessness have been marked symptoms.

**Etiology.**—The main etiologic feature of this affection is its hereditary character. Of this all writers are agreed, yet there are some who attribute the malady to syphilis; the fact, however, that it does not improve under anti-syphilitic treatment would seem to disprove this conclusion.

**Prognosis.**—The prognosis is bad, the disease being progressive and its duration varying from 10 to 30 years. If the patient does not succumb to an intercurrent

<sup>1</sup>President's Address at the annual meeting of the St. Albans Clinical Society, Nov. 3, 1913.

disease, he finally becomes bedfast, and dies of malnutrition, or in a state of coma, superinduced by repeated attacks of pachymeningitis interna hemorrhagica.

Most of the writers on this subject speak of a suicidal tendency, but no mention of self-destruction has been made in the writer's cases and none of their antecedents have attempted or committed suicide. Neither has there been any history of epilepsy in any member of this family. Very true the members of this family, who are still under 30 suffer in a marked degree from neuralgias and when ill are extremely nervous, yet much the same may be said of many other families who have not this heritage. The diagnosis of the malady is not difficult. The heredity, the chorea, the tendency to insanity and its development in middle life are the salient features.

To those who believed that the *spirochaeta pallida* in an attenuated form was the causative factor, much was expected from salvarsan, but unfortunately they were doomed to disappointment. The writer has used paraldehyde for the nervous symptoms and intermuscular injections of cacodylate of soda and Fowler's solution, combined with the mixed treatment per os and by inunction, but aside from the usual temporary psychical effect of a new remedy his patients have received no permanent benefit from the exhibition of the above remedies.

Gowers classified senile chorea with Huntington's chorea, but in this I believe he is mistaken, as it seems to be the general impression amongst writers on the subject that they are separate and distinctive maladies.

**Pathology.**—No definite pathology has been determined. Most of the cases of Huntington's chorea which have come to

postmortem show some increase in interstitial tissue of the cortex and an accumulation of cell elements about the vessels and some evidences of pachymeningitis, but whether these changes were the results of the specific disease or end results, it is impossible to determine.

In the past 25 years the writer has been able to trace eighteen well authenticated cases of Huntington's chorea, all from one woman, the great-grandmother of his two detailed cases. Mark you, this is not a family of degenerates, but on the contrary they have all been noted for their high mentality. Many of them have made a mark in the professions and all of them have shown great business ability, and even at the present time the patients are of the middle class, that is, none of them are laborers and those who have been committed to the insane asylums of our state have not been state charges, but have been maintained by their own estates. None as far as I have been able to learn have been addicted to drugs or to alcohol, and it has been difficult to even find a tobacco user amongst them. In fact, all are of exemplary, intelligent New England stock, who have lived quiet, well ordered lives, until they reached middle life, when the sword of Damocles fell and Life's perspective took on its sombre tinge. Practically all of the descendants of this woman who died in Stamford, Conn., over 100 years ago have developed Huntington's chorea, when they arrived at middle age. Three children of Case No. 2 are still under 30 and of course have not the malady as yet. What a theme for a Balzac should one of those beautiful and accomplished young women mate with a scientist, who knowing the situation and working with the incentive of sparing his progeny from this heritage, will discover its remedy,

or doomed to disappointment will be confronted by the certainty that the disease will work out its dole and be transmitted to generations yet unborn? The logical outcome of the matter, however, should no remedy be discovered for this disease is that the breed will in time run out, as in the writer's experience more than 75 percent of this stock are barren or sterile. On account of the enforced brevity of this paper and from the fact that I have been unable to get full notes on the history of many of the patients, only two case histories will be given in detail.

*Case 1.* R. M., aged 60. All diseases of childhood. Unmarried. No serious illness. No operation. No injury. Studied law one year. In business 4 years. Traveling salesman 12 years. Does not use tobacco or alcohol. Venereal history negative. Has been nervous and irritable for 20 years, but has grown worse since 1901. Sent to Waterbury Insane Asylum July 4, 1903, remained 8 months. Discharged unchanged. For past 8 years has lived with his mother and while unable to work has been out and around the house and street every day, although his malady has progressed gradually. Able to read intelligently and is able to give a synopsis of novels read showing unchanged mentality. Mother's family long lived and healthy. Disease inherited from father who in turn had received the legacy from his maternal grandmother.

*Condition, January 7, 1912.* Appearance. Patient well nourished, good growth of hair, no appearance of age. Spasticity of arms and legs, peculiar rolling gait, especially noticeable in the swinging of the right leg and thigh from the hip and constant movements of the hands and finger (athetosis), head rolling and nystagmus, constant jactitation of head, of buccinators, orbicularis oris and of the constrictors of the pharynx. Gait like one who is hilariously intoxicated. Tongue perpetually lolling like the dasher in an old-fashioned churn. Muscles of deglutition in noisy motion, while the respirations are of a grunting nature. His gait has a festinant character, that is he propels his body forward

in short shuffling steps. Suddenly his forward motion is stopped and he has retro-pulsion or falling backwards of the body, and unless assistance is given he falls either backwards or forwards as though he were running after his center of gravity. The vertical and rotary oscillation of the head, grimacing of the face and tongue muscles make his articulation difficult. This with his irregular spasmoidic contractions of the diaphragm and other respiratory muscles gives the voice a curiously jerking and groaning character, due to sudden interruptions of breathing. One could not call it stammering nor ataxic aphasia, but rather a difficulty of phonation, intonation and word sequence. Owing to spasm of the false vocal cords patient remains with his mouth open until spasm relaxes when his words are propelled forth in a hurried stream. Extra noises are thrown in as sudden inspiratory grunting or whooping noises, and he makes grimaces and curious contortion of limbs takes place and his speech is interfered with by weird pharyngeal barkings. In fact, he suffers from dysarthria in the superlative degree.

You are tempted to say with Shakespeare "I would thou couldst stammer, that thou mightest pour this concealed man out of thy mouth, as wine comes out of a narrow necked bottle, either too much at once or none at all. I prithee take the cork out of thy mouth that I may drink thy tidings."

In short, he seemed to have an in-coordination between the laryngeal and oral mechanisms of speech. The thought was still sound, but the intrinsic and extrinsic muscles of speech were in such constant motion that his meaning was almost unintelligible. Saliva dribbled constantly from the mouth, and this with food remnants about his clothing gave him a very repulsive appearance. Orientation normal as to time and place. Appetite good, bowels and bladder normal with occasional incontinence of feces and urine. Emotional. Irritable. Laughs and cries apparently without cause. Seems to be anxious to sell his property and to engage in new business. Wants to go to Kansas or Florida, anywhere in fact but where he now is, although he has a comfortable home and every attention. Resents the interference of nurse and is determined to feed and dress himself, things which it is becoming impossible for him to

do. Memory good. Can give day and date for all important events in his history and that of his near relatives. Can give names and ages of his friends, but when corrected appears angry.

Hands and feet swollen, cold and slightly cyanotic. Deep tendon reflexes (jaw, biceps, supinator longus, scapulo-humeral, wrist, triceps, knee and ankle) all exaggerated. Superficial skin reflexes unsatisfactory owing to the constant twitching of the patient. Babinski's sign absent while somewhat similar ones of Oppenheim and of Gordon could not be elicited. Romberg's symptom very marked, but had no particular significance from the fact that the patient swayed when the eyes were opened. The organic motor reflexes (cilio-spinal, scrotal and rectal) were also slightly exaggerated and ankle clonus was present. Pupils reacted to light and accommodation. Pulse 100 full and somewhat irregular. Heart normal, alkaline cystitis relieved by exhibition of hexamethylene-tetramine. Cannot touch end of nose with finger when eyes are shut and also cannot touch fingers of one hand with fingers of the other. Some paralysis of levator palpebrae, superior oblique and inferior recti muscles and in consequence the eyelids drooped and the eyes were rotated outwards and upwards.

*Tache cerebrale* was present. Temporal arteries hard and tortuous and blood pressure rising gradually. Astereognostic. That is, he was unable to tell what objects were placed in his hands by sense of touch. Blepharospasm or blinking movements of the eyes and occasionally he complained of double vision, owing probably to the disorders of the oblique muscles as he read a great deal without the aid of glasses. He had many habit spasms and tics of various kinds, but strange to say many of his movements ceased when he closed his eyes, and others ceased when he closed his eyes and assumed the recumbent position. This typical syndrome continued from his discharge from the asylum in 1904 until he was readmitted in the spring of 1912. At times his symptoms abated and he was apparently better, but soon this apparent amelioration was followed by a period worse than ever and he gradually grew worse mentally and physically until he had to be tended like an infant. He grew morose and melancholy, was filthy in his habits, struck at his

nurse and finally he was again sent to Waterbury, Vt., May 27, 1912. His case records covering both admissions I am able to reproduce here, through the kindness of Supt. D. D. Grout, M. D.

*Asylum Record.* Name., R. M. August 22, 1903. Patient is a man 51 years of age, a native of Vermont—occupation, traveling man—education High School—paternal grandmother had chorea terminating in insanity—mother's cousin insane epileptic and at Waterbury Insane Hospital—maternal grandfather died of apoplexy—father died in an insane asylum at Brattleboro—onset was at the age of 49 and was of gradual development—condition manifested itself in a desire on his part to transact business of which he was totally incapable—he wishes now to raise money with which to do business—no hallucinations—mother says he has never shown any disposition to do anybody a serious harm. Eats and sleeps well and is cleanly. Reports go to show the sister-in-law is of hectoring disposition—no delusions expressed—admitted here July 4, 1903, on physician's certificate; *Patient said:* Aimless disposition, doing nothing, wanting to do nothing (patient was not communicative). *Patient did:* Wandered aimlessly around. *Appearance and Manner:* Semi-idiotic, vacant expression—incoherence in speech—continually moving jaws. *Other facts:* Violent exhibition of temper—choked his sister-in-law on one occasion, intimidating nurses and friends of his mother, keeping the household awake nights by wanderings and mutterings—insisting on his mother drinking water whether she wanted to or not—hoeing a part of the garden where nothing was planted—aimlessly traveling the streets and muttering.

*Here:* No hallucinations elicited—consciousness clear—apprehends correctly the character of the institution and also the character of the inmates—*orientation* well preserved as to time, place and persons—insight defective—"Of course I am not crazy, my health never was better, I eat and sleep well and have no bad dreams." *Memory* good for both recent and remote events—*attention* well preserved although interest is directed mostly toward matters of small moment—*thought* is well connected and pertinent to subjects at hand—content is of limited scope, being restricted

and losing in energy by reason of a slowly progressive dementia—*judgment* and reason are defective, manifested by childishness in conduct and thought—*manner* is simple and expressive of little vigor or force—no pronounced delusions are expressed although a tendency to hypochondriasis is manifested at times—"my liver and kidneys are the only things the matter with me—the water here is much better for my kidneys than that at St. Albans." Denies charge in certificate—"I never ought to be charged with bad temper, I never feel nervous, I have not a nerve in my body and I am ready to have you try it—I never choked my sister-in-law in the world—she would say such hateful things to me—I came here to please my mother because she wanted me to"—lost employment probably from *lack of ability*—said it was because he asked for more pay—says all the business he wishes to do is to set up a small stand, which would cost him less than a hundred dollars—he would do a cash business and hence would lose nothing—*emotions* are well under control as a rule—little ambition or energy of feeling is expressed at any time—has shown no irritability of temper or violence in conduct since under observation—whole attitude is one of mild dementia with conduct in accordance without insight "all that ails me is my kidneys, so."

*Physical examination* by Dr. Wasson. August 8, 1903—slight ptosis of right eyelid—right shoulder on lower plane than left—right half of hard palate seems somewhat broader. *Taste*: could not describe bitter—called it peppery; readily detected sweet and salt—recognition of familiar odors deficient, showing lack of associative linking of present with past experiences—said wintergreen was strong and disagreeable and violets "pungent" and "pleasant"—reflexes lively—gait somewhat uncertain—tongue in constant choreic activity—slight choreic movement of head, which is carried inclined to right side—also slight movements of right arm and leg—respiration puerile over right upper lobe and jerky—heart action somewhat irregular and rapid.

*Urinalysis*: Chlorides diminished.

*Etiology*: Heredity—paternal cousin insane, epileptic—maternal grandfather died of apoplexy.

*Duration*: About two years previous to admission—early in 1901 here since July 4, 1903.

*Treatment*: Custodial and hospital routine with tonic of syrup hypophos. comp. with elix. calisaya, with no apparent reaction as he was in good physical condition when admitted.

*Diagnosis*: Custodial dementia, on ground of choreic movements with gradual and progressive development of dementia, manifested by lack of business judgment—childishness, tendency toward somatic delusions—thought content limited—restlessness—no insight—chorea is mild type and of rather late onset—dementia also mild.

*Prognosis*: Bad as to recovery but seems capable of doing well outside. Discharged and remained at home in St. Albans over eight years.

*Physical examination* by Dr. Wasson, May 30, 1912. *General appearance*: Has changed considerably since his previous examination. He now lies abed helpless and untidy. He is in more or less constant choreic activity—general nutrition is very good. Hemoglobin 90 percent—blood pressure very high 236 M. M.—170—190—radials soft—pulse rate rather rapid.

*Motor functions*: Chorea movements are fairly constant but not so violent as in most Huntington's cases—head, tongue, neck, arms and trunk are all involved—a certain amount of paralysis and spasticity of lower limbs evident—this so more marked below the knee. Feet are in an extended position and patient is unable to flex them. He can straighten out his legs and flex them at knee or thigh. Arms move fairly well but fingers are moved with uncertainty, spreading out stiffly in various directions. Tongue is shown with great difficulty.

*Reflexes*: Knee jerks are sharp, and a rigor persists for a few moments after each tap—elbow jerks fairly alert on gently scratching plantar surface besides the quick reflex jerk of withdrawal, the great toes slowly but strongly extend themselves—the more so on the left side—ankle clonus is well marked on both sides, more so on the left.

*Lungs*: Exhibit no abnormalities, respirations are rather jerky and spasmodic in character.

*Heart*: Apex beat in fifth interspace but

nearer middle line than is ordinary—action somewhat hurried—no murmurs—patient's demented condition will not admit of his cooperation for the other physical tests.

*Pupils* are equal and respond promptly to light.

*Urinalysis*: Urine examined—transparency slightly hazy—color amber—reaction acid—sp. gr. 1026—urea 3.3 per cent.

*Microscopical*: Few epithelial casts—few narrow hyaline casts—one dark granular cast—numerous mucous shreds—few pavement from epithelium—few leucocytes.

*Physician's certificate states* May 27, 1912. *Facts observed*: appeared demented, did not realize his condition—repeated the same remark many times—motions are incoordinate, speech is difficult and enunciation indistinct.

*Facts learned*: is irritable, resistive, strikes his attendant, at times becomes very profane without provocation—is helpless, unable to care for himself in any way, yet says that he can get along without anyone to look after him.

Admitted to 6th hall at 2:00 p. m.—he is unable to walk—was given a sponge bath and put in bed—being unable to stand he was not weighed or measured.

May 30. Patient is helpless from paresis of the lower limbs, especially, and lies abed untidy and filthy unless constantly watched—dementia is very profound—about his only request given in a monotonous, drawling tone of voice was, "I want to go home." When asked where he is, said, "Waterbury." Will not as a rule respond to questions.

May 31. *Arcus senilis* is quite well marked—does not know doctor's name but calls him "doctor."

Sept. 2. Remains helpless in bed, *untidy* and without intelligent interest in anything going on about him—he is quiet for the most part, but now and then cries out—*articulation* is so defective that it is impossible to understand much of what he tries to say.

Oct. 17. Patient fails very slowly but steadily both physically and mentally. He is a perfectly helpless, bedridden, untidy dement, gradually exhausting himself by constant choreic spasms.

Feb. 14, 1913. Died today. Remains sent to St. Albans, Vt., for interment.

The following is a brief history of H. M., father of R. M., taken from the records of the Insane Asylum at Brattleboro, Vt., by Dr. Lawton, Supt.

Patient was admitted July 25, 1887. Native of Vermont. Resident of St. Albans. Committed and supported by friends. Farmer. Married. Suffering from chronic delusional mania. First attack. Of eight years duration. Supposed cause, chorea. Strongly hereditary. Mother and sister died insane. Not suicidal. Attributed all of his bad feelings to medicine given him by physicians at home. Suspicious of everyone and regarded his best friends as his worst enemies. Was boisterous at times and thought his wife and son had attempted to murder him. Abusive of his wife and destroyed furniture while in a fit of rage. While at the retreat was contented, happy and tractable. Chorea increased in spite of treatment, and he sustained frequent falls; on one occasion being thrown from his bed at night because of choreic movements. Toward the latter part of his illness he became excessively irritable and had exacerbations of excitement. During the last six months of his life was unable to walk without assistance. Dementia progressed rather rapidly. Speech ataxic during the last year of his life. Death resulted from exhaustion.

Case 2. Mrs. Millie E. Female, aged 52. Last examination October 29, 1913. Sister of R. M. Deaf since 1893 from lagrippe. Eyesight failing. Wears glasses since 1900. Appetite irregular. Bowels constipated. Sleepless and nervous at night. Married. Three children, aged 30, 27 and 24 years. Widow. No venereal history. No serious illness, no operation. Digestion good. Hemorrhoids for last 20 years. Tongue clean. Teeth decayed. Power of executing normal movements diminished. Reads intelligently, but not intelligibly. Powers of phonation, articulation and enunciation below par. Knee jerks and all other deep reflexes exaggerated. Romberg's symptom well marked. Babinski, Oppenheim, Gordon and Chadwick reflexes absent—that is there are no abnormal reflexes on the part of the upper motor-neurons. The pupillary reflexes as to light and accommodation nor-

mal. The plantar, epigastric and abdominal reflexes present. Her tactile, pain and temperature senses normal. Musculature very well developed as to size, but strength of the hand and arm muscles by means of a dynamometer tested less than 50 percent of what they should be in a woman of her age and station. There is much spasticity of both extensors and flexors of arms and legs, giving the voluntary movements a stiff and awkward action. Back muscles fairly normal in contour except a mild degree of left thoracic scoliosis.

When walking her muscles of locomotion show spasticity, paresis and ataxia. She is unable to pour water from one test tube into another without spilling it, showing intention and spastic tremors. On this account she feeds and dresses herself with difficulty. She is emotional, depressed and cries easily. She has a well defined attack of hysteria, mingled with writhings and outcries and her limbs cramp in various attitudes. Unable to contain herself and feels exhausted afterwards. Unable to execute the more exact finger movements, such as picking up pins and is unable to touch nose with index finger or place index fingers together when eyes are closed. Stroking the skin with the finger nail shows the classic white line, the "tache cerebrale."

Muscles of speech and deglutition show defective coordination, fibrillary twitching of eyelids and slight nystagmus or rolling of eyeballs.

Unable to hold tongue in one position more than a few seconds. No quinquaud finger crepitans. Dreads to meet people for fear they will talk about her disease, but as her mentality is still acute can give much information about her family both immediate and remote. Does a good deal of housework but tires easily and notices that her energy is on the wane. Attacks of hysteria, not so frequent as they were a year ago when they recurred every week. Has felt this incoordination of movements and loss of energy for past ten years, but only in the past three has she noticed that her concentration of thought has been waning. Has ataxic commissural aphasia—that is, her speech is defective, not from defective intellection, but for want of power to coordinate words in articulation and for want of power to connect words with ideas.

In short, many and all of her symptoms are those of R. M., only not in the superlative degree.

I have had an unusual opportunity of watching this case for the past eight years and during that time "The mills of the gods have ground slowly." The disease, it is true, has shown a marked improvement over a year ago. Her hysteria is less; her concentration of thought greater; she eats and sleeps better and none of the other symptoms have increased materially. This, as I have said elsewhere, is one of the salient features of Huntington's chorea.

In conclusion I realize only too well that it is too big a subject for the general practitioner and should only be handled by a neurologist who is familiar with the manifold tests of diseased nerves and who could thereby make his meaning more intelligible.

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## METHODS AND EFFICIENCY IN MEDICAL OUT-PATIENT WORK.<sup>1</sup>

BY

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**Introduction.**—Out-patient departments have usually been regarded as minor parts of hospitals. They were organized to treat ambulatory patients who were not sick enough to warrant admission to the hospital wards. Until recently work in them has been so inferior to that in the wards that little has been accomplished in the way of study and research. Within the last five years, however, there has been a growing realization of the importance of their position in the hospital system. Physicians are coming to recognize the fact that out-pa-

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<sup>1</sup> Read at the Section of Medicine, College of Physicians, Philadelphia, February 24, 1914.

tient departments properly conducted and including social service compare favorably with the wards as laboratories for the study of certain types of disease. Not infrequently the results secured in them are more satisfactory and opportunities for the exercise of preventive measures are more numerous than in the wards.

With the hope of arousing interest in and discussion of the standards for out-patient work, it has seemed wise to summarize briefly some of the methods used and results obtained in the Medical Out-patient Department of the Hospital of the University of Pennsylvania.

The data on which the report is based have been drawn from an experience of over five years in this work, from a study of the methods of the leading out-patient departments in this and other large cities; and from several investigations carried on with the help of the social service.

In discussing this report it must be remembered that in addition to the regular routine, we give to the third year students in medicine instruction in history taking, physical diagnosis and practical medicine. The students report in sections of thirty to forty on three days of the week, with voluntary service on Saturdays, making practically four teaching days a week. These men are used as assistants, and their work is supervised and criticised by the physicians on duty at the time.

**Organization and Staff.**—The department is under the charge of a chief physician; it is divided into four sections, each in charge of a physician. These physicians have two groups of assistants; one on duty Monday, Wednesday and Saturday; the other, on Tuesday, Thursday and Friday. This distribution of days is made to give each group two teaching days and one day with-

out students. Service is continuous—that is, the physicians are on duty the whole year. From observation and practical experience we have concluded that results are better with continuous service than with services which change every three, four or six months.

A common weakness in many out-patient departments is that the patient is treated by a different physician at each visit. As a result, records are not completed, treatment is not continuous, the patient becomes dissatisfied because no one seems to be in charge of him, and discontinues treatment before he is cured. About a year ago we divided the assistant physicians and patients into two corresponding groups, each coming on the same days respectively, and have since tried to put each patient under the care of one physician. This plan brings into prominence the personality of the various physicians and their ability to hold their patients, a point thus far not sufficiently emphasized in this line of work. The assistants are thus made responsible for the details of work on patients under their direct care.

The physician in charge of each section has a small clientele of his own, but a large part of his time is taken in dealing with patients who need special study. He also keeps general oversight of records and treatment in his section and is responsible for the work of his assistants.

The chief of the department oversees all of the work, making criticisms and suggestions, arranging for new appointments to the staff, and acting as consultant on problems which the physicians in charge of sections have not been able to solve. This part of his work could best be accomplished in a room apart from the others, to which the more difficult cases might be referred after

they had been worked up in the sections. We have not been able to carry out this plan for lack of space. For the present the chief sees these patients in the regular rooms in consultation with the physician or assistant.

This arrangement of staff where the chief does not see patients until the details of their condition have been well worked up should act as a decided factor in deterring well-to-do patients from coming to the department for treatment. Often the presence of the chief attracts patients who should pay a moderate fee outside. If, however, such patients have to go through the regular routine before they can see the chief, they are less apt to crowd the outpatient department.

With a staff constructed as outlined, fifty to seventy percent of the men are recruited from those in general practice, the remainder from those working along more or less specialized medical lines. The tenure of service for most of the staff is as a rule for the few years between the time of leaving resident service in the hospital and that when they become engrossed in active practice. These men need some drill in details and instruction in the science of medicine. The majority of them do not attend medical meetings, and therefore miss the stimulus of newer ideas, differences of opinion and medical discussions. To meet this weakness we have been holding staff meetings for the past four years once a month from September to May. The program at these meetings is made up of presentations by members of the staff in the form of discussions of some phase of etiology, symptomatology, methods of examination or treatment. These programs are being gradually changed to include reports on groups of cases or special problems of investigation

or research. In this way the men doing general practice and making up the larger part of the staff have their medical vision enlarged, and, whether they remain in the department for one year or ten, should be materially helped to meet medical problems outside. These staff meetings have developed a "get together" spirit which has been of great assistance in the development and improvement of the department.

**Admission of Patients.**—All new patients are admitted through the social service department. These patients may be divided into two classes: one including those unable to pay for outside medical attendance of any grade; the other including those who have their regular physicians for general treatment, but who are dissatisfied with their lack of improvement, and are unable to pay consultation fees. To this latter class belong patients suffering from conditions for the solution of which special examination of some individual organ, Wasserman reaction or X-ray examination, may be necessary. The first group we regard as regular patients; the second we feel should be given the benefit of an opinion, and these we admit as consultation cases.

The basis for this preliminary grouping is obtained from data secured by the social worker at the admission desk. She fills out the heading of the record, and takes a brief social history covering the following points: length of patient's sickness, previous medical treatment by physician or hospital, occupation, wage, number in family, total income, and rent. From the answers to these questions the social worker determines whether the applicant is to be admitted as a regular patient or for consultation. In a few instances where the financial statement shows that the patient can pay a moderate consultation fee, and especially if he has not

made a reasonable effort to secure relief from outside physicians, he is refused admission. While all the factors in each case must be considered in making this decision, in general we believe that a family of five paying \$18.00 a month rent with a total income of \$18.00 a week or \$80.00 a month can afford small fees for short illnesses without depriving them of food or other necessities.

In the consultation cases, as soon as a diagnosis has been determined and a course of treatment outlined, the suggestion is made to the patient that he return to his previous physician with a note stating the diagnosis and giving advice as to treatment. If he is anxious to continue as a patient in the department, he is referred to the social service for more detailed investigation. If it is now found that he cannot afford outside medical aid, he is retained as a regular patient. If, however, he can afford to pay a physician, the social worker tries to persuade him to return to his previous physician. If this does not seem practicable, she helps him to choose one within his means in his neighborhood or elsewhere. In no case must she volunteer the name or address of any of the out-patient physicians. Under no conditions is such a patient permitted to remain in the department for a period longer than two months without reinvestigation by the social service.

To avoid these complications we encourage free consultations with outside physicians on patients whom they regard as unable to pay a consultation fee. We believe that the physician is more likely to hold his patient when both patient and physician feel that everything possible has been done to relieve the condition, and that the physicians by the consultation may receive some new ideas in the methods of diagnosis or

treatment. If properly conducted the department may thus act as an educational centre for physicians throughout the city.

New patients are distributed in order to the sections of the department, so that at the end of the month every section will have received an equal number of patients.

The readmission of patients at subsequent visits is at the desk, where the records are kept in the charge of a clerk. Every patient is weighed at each visit. Records are arranged in groups and taken to each section so that the patient never has an opportunity to read his own record.

In order to test this grouping system we reviewed the records of the consultation cases admitted during December, 1913. Out of 143 new patients 37 or about 26 percent were admitted as consultation cases.

Summarizing the records of twenty-five of these we found that twelve patients came for opinion only; and of these twelve, five were referred by their own physicians. The fact that the department is in connection with a large teaching institution probably explains why so many patients come to it for an opinion. Among these will be found many who come from outside of the city and who are not aware that the out-patient department is only for patients who cannot pay a physician. Many of these are anxious to pay for their examination.

Only five of the twenty-five had been sick for periods of less than three months, and ten had been sick for over a year. Only two had not been treated by outside physicians. From this we may be safe in saying that these patients come to the hospital as a rule only after they have been sick for some time and have not been relieved by one, two or more physicians outside.

A review of the financial condition of these patients brings out the fact that they

represent the class of working people just above the dependent class who, as long as they are not over-burdened with sickness or bad fortune, are able to pay reasonable expenses, but who in case of illness of the chief bread-winner or a long illness of any of the members of the family are thrown into debt. They come from families of from two to six each, pay rent of from \$10.00 to \$18.00 a month, and have total family incomes up to \$90.00 a month.

The final disposition of these patients was very interesting. Of the twenty-five, fourteen were referred back to their previous physicians, three were transferred to the hospital wards or to other departments, three were improved and stopped coming for treatment, while five did not come long enough for any result.

From this review we believe that a reasonable discrimination can be made at the admission desk between the regular patient, the one to be admitted for consultation, and the one to be refused admission; that this discrimination can and should be made only by a trained social worker.

**Records.**—Efficient out-patient work is possible only with complete records. The failure to recognize this relation has been one of the greatest factors for encouraging careless haphazard work in out-patient departments. Accurate diagnosis is absolutely impossible, and treatment is therefore ineffective unless there is a satisfactory record where the results of the various examinations are brought together and summarized.

A standard record should include: complete history, detailed physical examination, full notes of subsequent visits with the results of laboratory or other special examinations, record of reference to the social service where necessary and note of the re-

sult of such reference, diagnosis properly supported by history and examinations, and treatment recorded in sufficient detail so that it may be checked up at a later visit, or statement made of the disposition of the patient if treatment was not given. This is a high standard for out-patient work, but we have proved that it may be attained. Of course, there are some obscure cases where accurate diagnosis is most difficult, but these same difficulties would appear in observation of these patients in hospital wards under the best conditions.

In order to bring about this degree of efficiency, various methods have been used. In the first place, at the beginning of each teaching year students in attendance are given outlines of the history and physical examination, and each man on duty in the department is required to follow these outlines. In the second place, after comparison of records in different sections it was found that the section doing the best general work and keeping the best records was as a rule the one having the largest number of return visits. Curves were plotted to show the number of return patients for each section for each month. The diagram was placed in a prominent place in the record room and acted as a stimulus to better records and better work in the different sections. In the third place we have supplemented the diagram with another system, which I think will come to be regarded as the only satisfactory way to check up such work; namely, a review of the records at the beginning of the second month after the patients have been admitted. In this review pointed criticisms are made in red ink on the records by the chief of the department, and an efficiency percentage worked out for each section. Such criticisms as "poor history," "unsatis-

factory physical examination," "diagnosis not supported," or "treatment inefficient" stimulate better and more careful work in later records, and have been a big factor in improving the general work of the department. This method also has the advantage of pointing out the particular weakness in the work of each man.

In critical study of the records it has been found that some of the patients stop their visits as soon as they begin to feel better, but before they are completely cured, and then later report for treatment in as bad or worse condition as at their first visit. In order to meet this weakness, we have recently introduced a "Follow-up System," that has already proved very helpful in our children's department. When the patient is first admitted a small card in the form of a calendar with a place for the patient's name, address, division number, and record number is attached to the record. On this card the physician who sees the patient marks the date on which he wishes the patient to return. When the record is filed, the card is placed in a calendar index, so that each day the clerk will know what patients are due. If they do not report, she holds the card five days, and then brings it to the attention of the physician, who determines whether a letter shall be sent urging the patient to return. The system thus far has worked very well, but we have not been using it long enough to judge definitely of its value. It is likely that the system will be changed a little later, so that the cards will be used not on all of the patients, but only on those whom the physicians think should be followed up. It is certain that without some system of following up patients, high grade out-patient work cannot be done.

**Results.**—It is difficult to measure

medical results in an out-patient department. Various methods have been proposed, but most of them have been applicable only to the study of a specific condition. None so far as I can determine have been applied to the work of a department as a whole. With the purpose of discovering such a method and with the hope of securing data for improving our work, some months ago I asked the social service department to make a study of one hundred consecutive cases as they applied for admission to the medical out-patient department. In each case as much information as possible was gathered at the hospital and this was supplemented later by home visiting. The study was begun April first, 1913, and the summary of medical results obtained was made on July 15, 1913.

This study was carried on under the personal direction of Miss Helen Glenn, the head of our social service department, to whom I am indebted for the following data, and also for much help and cooperation in the work along medico-social lines in the medical out-patient department. For the purpose, however, of this paper I will only touch upon the facts obtained in this study bearing on a criticism of our work and its medical results.

In every case the social worker tried to ascertain the patients' criticisms and suggestions in regard to the service. Fourteen criticised the service. These criticisms were as follows: One nervous woman said there was "too much confusion"; four disliked the examination by the students, and would not return for that reason; one said the doctor was blunt; another that he was too young; one objected to the red tape at the admission desk; two had been frightened by a test meal; the remaining four did not like seeing a different doctor each time

(the system has now been changed so that the patients see the same doctor at each visit); eighty-six spoke highly of the department and the treatment they had received. On the whole the criticisms were about the same as they might have been in any doctor's private office.

The determination of the results of the treatment in the department was made by consulting the medical records on July 15, that is, about three months after the patient had been admitted. Where a definite statement had been made it was verified by a visit by the social worker to the home of the patient. Where no statement had been recorded on the medical record, the social worker reported the patient's own statement as to his condition.

Of the 100 cases studied:

Six had returned to their own private physicians, and

Two to other hospitals.

Three had given wrong addresses, and

Two were afraid of a test meal.

Twenty-three had been definitely transferred to other out-patient departments or wards of the hospital, the State Tuberculosis Dispensary, Phipps Institute, or the Philadelphia Hospital.

The fact that this study was made before we began to have a trained social worker at the admission desk may explain why there were so many transferred patients. With the system now in use at least some of these would have been sent at once to their proper department.

Of the remaining 64 cases:

One was reported as having died, and  
Twelve as unimproved;

Six as somewhat improved, and

Forty-five as either well, much improved, improved or working.

When we consider that transference to

the proper hospital ward or dispensary means efficient treatment on the part of the out-patient department, we then have 23 cases so disposed of plus the 45 showing definite improvement, making 68 out of 100 patients as having been definitely helped by their admission to the department.

Our final summary then would be:

Of the 100 cases studied:

Sixty-eight were satisfactorily treated or disposed of;

Six were improved;

Fourteen discontinued treatment for various reasons, and

Twelve were unimproved.

It may be of interest to know that the diagnosis of the twelve who were unimproved were as follows:

Cholelithiasis .....	2
Neurasthenia .....	2
Carcinoma .....	1
Migraine .....	1
Chronic Interstitial Nephritis .....	1
Bronchitis and Myocarditis .....	1
Emphysema with Asthma .....	1
Chronic Arthritis .....	1
Refused Operation .....	1
Undiagnosed .....	1

**Conclusions.**—From this survey of methods and results of treatment, it may be reasonable to draw the following conclusions:

1. That out-patient departments are most important parts of the hospital system, and necessary factors in the treatment of disease among the poor of a large city.

2. That efficient work in them can best be carried on by a graded staff properly instructed in the essentials of medicine and on continuous service.

3. That treatment of out-patients should be as individual and as personal as that of patients in private practice.

4. That the question of a patient's right to free treatment is a social one and can definitely be decided at the admission desk.

5. That complete records are essential to thorough work.

6. That adequate treatment is possible in many cases only with the help of the social service.

7. That with a department properly organized and developed it is possible to obtain results as satisfactory with the material at hand in the out-patient department as in the wards.

1805 Pine Street, Philadelphia, Pa.

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## THE VALUE OF FRESH BLOOD EXAMINATIONS TO THE GENERAL PRACTITIONER.

BY

ROBERT L. WATKINS, M. D.,  
New York.

The *modus operandi* for making a fresh blood examination is very simple; but it necessitates the presence of the patient before the hematologist. And when one presents himself for examination he need not be frightened by expecting that the examiner is going to take a quart, a pint, or even a teaspoonful of blood from him, as only a drop is needed; and this is taken from either the wrist or lobe of the ear. The former is preferable because it is the most convenient, and the least dreaded by the patient when the subject is mentioned to him; and, besides, the blood so obtained is capillary or arterial, and not venous as it is from the end of the finger, which always contains deleterious matter.

Again, a fresh blood specimen reveals things that cannot possibly be seen by any other method of blood examination. There are changes that take place in the cells and in the serum the significance of which is important. Dry blood, or that five minutes old, does not allow the examiner to discover these. The ideal way, if it were possible, would be to examine the blood as it cir-

culates in the body—this being impossible, we must use the next best method, and that is to examine it as soon as it is drawn, and make a photo-micrograph for recording purposes.

If the general practitioner has a case for example of doubtful tuberculosis, whether of the lungs, joints or glandular system, a fresh blood examination for the presence or absence of the mycoderma or Salisbury yeast will determine the diagnosis. A photograph is then made of the yeast in among the blood cells—and a copy sent to the party desiring the examination, who then has bona fide evidence that such existed on that date, and he applies the proper remedies for its eradication or removal. So persistent is the yeast in both the advanced cases and in the very incipient that its presence is unmistakable. Exposure to the air very quickly dissolves it, so that a "migraf" or photo-micrograph must be quickly made.

Rheumatism, the most prevalent of all diseases, is not only discernible in the blood in its latent stages, but the form, the kind of crystal that predominates, whether urate, phosphate or cystenic is easily ascertained. And again I insist that a photograph then made serves the general practitioner as a definite landmark or guide by which to treat and follow the disease in his patient.

So, when a large number of microcytes are seen in the fresh blood, the neurotic condition of the patient can easily be differentiated from the rheumatic. This neurotic microcytosis was first written up by the author many years ago in the *Journal of Hematology*.

The kind of fresh blood examination here pointed out has never been taught in any college or laboratory in the past, and is not so taught today. Why, I could never understand; but recent investigation among

physicians in regard to it has revealed to me the fact that it has not been presented to them in an understandable light. At this time I doubt if there are six physicians in the United States who are experts in this form of blood examination—possibly there are a dozen who *know* its value; yet it is the simplest and oldest method in existence—having been practiced more than a hundred

A fresh blood examination revealed the blood in the condition shown in his photo-micrographs (see illustrations). If this had been a case sent to me for diagnosis by a physician I would have mailed prints of the blood photos to him, but, as it was not, I immediately began treatment. From these photographs it is readily seen that the young man had plenty of normal red cells and



Fig. 1. Bile Pigment in young man's blood.  
X400.

years ago by John Hunter, and, in more recent time, by Salisbury.

As an illustration of its value I will cite, in a few words, the case of a young man who came to my office from out of town. He was 17 years old, very weak, and slightly jaundiced. The jaundice was scarcely noticeable—weakness and inability to work very long at his studies were the principal symptoms.



Fig. 2. Bile Pigment X800.

the normal number of white cells—the hemoglobin was 70%—but bile pigment was present in quantities in his blood. The physician would, therefore, very naturally turn to the liver and bile duct, excluding even pernicious anemia, which was by some suspected in this case. If this blood had been stained no such diagnosis would have been made—and the time required to make this examina-

tion is insignificant compared with the technique of a dry blood examination.

I have often had students look on these often plainly discernible "chunks" of bile pigment, and wonder if such could be true,

under the microscope often helps him in determining other conditions.

Other important pathological conditions could be shown just as plain as the above —photos taken with the "migraf"—in both

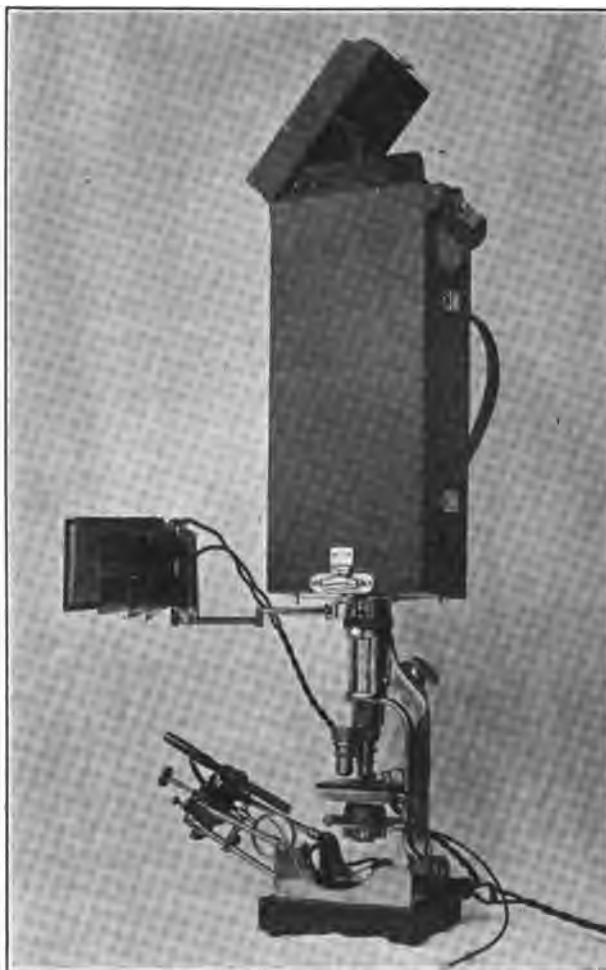


Fig. 3. Portable photo-microscopic apparatus, with 1000 candle power arc lamp, 17 ohms, resistance rheostat, with microscope. (All weighing less than ten (10) lbs).

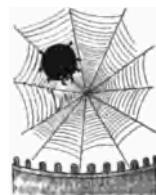
for, to one inexperienced, it looks like foreign matter.

It will be noted from the illustrations that the cells were moving when these photos were taken, but the expert cares not for this—in fact to see the cells move about

hospitals and private practice during the last twenty years, but it was thought best to limit this article to a few practical points by means of which the hematologist may aid the general practitioner in his work.

138 W. 71st Street.

# THE ANNOTATOR



**Indecent Vaudeville Performances.**—Many of the present day acts in vaudeville have gone to an extreme which should not

be tolerated in respectable communities. The oft repeated statement that the public demands such shows is not only false but positively insulting. The indecent small minority might demand them, but the great majority of the

population are opposed to them and do not patronize them. It would be just as false to say that the public demands gambling dens, because there are enough gamblers to make the business pay expenses with a big profit too. The subject of theatricals may seem a bit out of the sphere of medicine, yet the psychic and sexual effect on the young is so marked that the matter could well be discussed by medical societies. There is no question that serious nervous troubles are caused by this premature stimulation of the sexual system, and that it leads to clandestine relations which are followed by infections so common at these ages. All of this could be prevented if the managers had more civic pride and a sense of decency, but as some of them have neither, it is time for a more rigorous censorship. People who think that anything which pays is tolerable should be brought to their senses. It won't do to tell us to keep young people away from the theatre. There is a very legitimate field for the drama in education, morals and amusement, and in medieval times it was a means of imparting religious information in mystery plays. There is now as always an overwhelming demand for the theatre and a clean theatre at that, but many actors and managers seem to think that a play is incomplete without at least one filthy suggestion. These remarks are suggested by

a very prominent vaudeville theatre whose recent program was so nauseating as to drive away patrons.

**The Hot Paraffin Bath is the Latest Parisian Novelty.**—One hesitates between a tendency to smile it away or look further into it. So many ridiculous things prove to



be serious truths that we are afraid to comment one way or the other. A Doctor Barthe de Sandfort has been reported to have given the Academy of Medicine the results of his experiences since 1901. It seems that it is possible

to apply a higher degree of heat painlessly than with water, and consequently there are effects on metabolism and absorption of effusions not seen even in the applications of hot air. As a coating for open wounds it seems to have a remarkably beneficial effect on healing. The details will come out in scientific medical literature in time and until then we must wait patiently. The Frenchman loves to be in the spot light, if even for a few moments of a long dull career. He would rather be famous for making a *bon-mot* than for making a fortune. The whole nation is on the constant search for something new and startling. It is their genius. No wonder so many therapeutic advances come from France. Of course many bizarre things have been suggested only to be forgotten or laughed over, but it certainly behooves us to take French suggestions seriously until we can laugh. It sounds ridiculous to say that these patients are boiled in oil, but after deducting for the exaggeration there may be a germ of

truth in the short application of greater heat than is possible with water.

**Cancer Research.**—The study of cancer is being prosecuted all over the world more vigorously than any other disease, and

much money is being subscribed for this work, yet the cause seems no nearer discovery than it ever was. The suspicion grows that we are working on wrong lines, because no theory proposed so far is able to account for all the known

facts. The more or less riotous growth of the cancer cells may be due to a stimulant of the normal tendency to reproduce, or to a weakening of the hypothetical inhibitions. In either case an internal secretion may be at fault and many a man is thinking in that direction, entirely abandoning the very plausible parasitic theory and the still more fascinating supposition of a defect of metabolism. A mere boy is perhaps destined to think of something which will explain all the apparent inconsistencies. All great ideas of this nature are conceived by young men, some scarcely out of their teens. We would like to suggest that teachers might set their students to thinking on the subject. Perhaps the right man is in college now, and all he needs are the facts and the knowledge that something so far unthought of is the cause of this great scourge. The money donated is well spent no doubt, but its present purpose seems to be the collection of facts for the coming great man who can use them.

**Youthful Credulity.**—The trustfulness of youth is the normal antidote to misokainia which we have mentioned merely to call attention to the more dangerous tendency of the young to accept every new thing with unquestioning faith.

The clergy have long known of the wisdom of teaching matters of faith to mere children who blindly accept the unprov-



able and retain their faith throughout a long life in spite of all efforts to destroy it. This youthful characteristic is quite persistent and accounts for the manner in which young practitioners stampede to every thing new and exploit it until its dangers and limitations are worked out. The conservative elderly section pursue a policy of watchful waiting until the innovation is thoroughly proved to be safe and sane. The two classes of young and old thus neutralize each others defects, and the world moves on serenely as though all were perfect. So we need not worry over the boyish enthusiasm which has so greatly emphasized the benefits of anti-typhoid vaccination and blinded itself to the dangers. All will come out in the end and the measure will be confined to its proper sphere. Misokainia will hamper its wide adoption until all the facts are known and discussed. Suppression of facts will only create a scandal which will injure the measure unjustly.

**Misokainia.**—Here is a rather new word which many of us would do well to print in our hats so that we would read it many

times a day. It means hatred of the new, and is a perfectly normal psychic phenomenon which begins to make its appearance at full mental maturity and gets progressively more marked until it amounts to a mania in our mental de-

cline. Harvey is credited with saying that he expected every physician over 30 to reject the idea of the circulation of the blood, Kepler said that his laws would be accepted by only those under forty and Darwin expected to convince only young and flexible minds. As we have frequently mentioned, no man over forty when Jenner announced his discovery ever accepted it. We like to dwell on this topic to see if we can do something to check the unreasoning professional opposition to new principles such as teaching laymen through lay journals. This reform should not wait until the young grow into positions of authority. The sad side of misokainia is our increasing inability to accept new remedies and new therapeutic means of any sort. We must be on constant guard to check this normal ten-



dency or else plan to retire before we are forced to the wall by younger minds with better and more modern methods.



**The Alien Insane in New York.**—The Medical Society of the State of New York, at the last annual meeting, appealed to Congress to provide for a more rigid mental examination of immigrants by experts, in order to deport them at once and thus lessen the enormous burden of caring for them later. It is said that at present there are 9,244 foreign born insane patients in the State hospitals and that they cost the tax payer \$2,500,000 a year. Of course this burden is unjust and can be diminished, but the very minute the experts find a case of mental deficiency which is likely to prove a public burden, his friends will make the plea that this land is open to the meek and lowly of all the world and it is unjust to exclude this particular case because he is not as bright as the rest of us. Our regulations are splendid in principle, but generally resisted when applied to individual cases. Perhaps it would help matters if we were informed as to how long after arrival these nine thousand people were committed, whether any were crazy when they arrived in America, and if so whether it was possible to have detected them at that time. Among the large number of foreign born citizens, the same percentage should become insane as among the native born, and nine thousand may not be so very much more than one would expect. Perhaps we may have to content ourselves with a law which will permit deportation of all who become insane in a short while, say five or ten years as these were evidently unfit on arrival. The others may be burdens we must carry as long as this land is considered a have of the oppressed, and not a place for the best of Europe. Nevertheless we heartily commend the effort to have a more rigid mental examination of immigrants with a view of excluding those likely to become public burdens.

**Deaths at Panama.**—The deaths caused by the Panama Canal construction since May 1, 1904, are reported to have been 1,219 from injuries and 971 from disease, which is a remarkable showing. It is said that a human life is sacrificed to the god of "industry" for every floor of a modern skyscraper. At that rate the deaths at

Panama would have been many thousands, so there must have been great care taken to prevent accidents. The number of deaths by disease contracted there is very deceptive for it takes no account of those sent home to die like Colonel Gaillard. This number cannot even be estimated beyond the bare statement that it is very large. Prognosis is now so accurate that physicians can tell what cases will not recover in the tropics, and there is a constant stream of patients sent home to recover or die. Most of them have their lives prolonged thereby, but it is safe to say that these diseases invariably shorten life. The cost of the canal in health and life is therefore far more than the deaths on the ground. It is said that even these recorded fatalities are more than the total losses in the Revolutionary war, yet how much attention is given to the martyrs of war and how little to the far more numerous ones of peace. It seems that everything good in this world must be bought by blood. Why not erect at least as many monuments to the peaceful builders of civilization as we do to the militant builders of governments? As for bravery, it is far more dangerous to engage in modern engineering enterprises than to go to war.

Hypodermic needles which have become clogged may be made good as new by boiling in strong solution of washing soda for several minutes. This not only opens them up but it will brighten and clean them up like new.

Flannel cloths wrung out of hot water and saturated with oil or spirits of turpentine and applied, directly relieves deep-seated pain in the chest, stomach, abdomen or kidneys.



### The Masked Piety of the Neurotic.

To the Editor

AMERICAN MEDICINE:

I have just finished reading the translation, by Tannenbaum, of Stekel's article on "The Masked Piety of the Neurotic." The first thing that strikes me as I attempt to order my thoughts is that Stekel—like his great colleague, Freud—also a Viennese, tries to explain too much. Freud, if my recollection of a couple of courses in psychology does not deceive me, discovered some interesting and indeed important facts with regard to the psychology of sex. He immediately set about applying these facts to the explanation of everything from the binomial theorem to the high cost of living. Similarly Brother Stekel doth arise and present some observations with regard to religious phenomena in neurotics. Then he proves that practically all atheists, and all other men whose religion has broadened beyond a dogmatism which has been preached to them in their youth, fall into the neurotic class. I am assuming that the reactions which are attributed to neurotics are supposed to be characteristic of them, for if the author merely states that neurotics have these qualities incidentally, and that normal men may also have them, his observations become futile.

The first important neurotic phenomenon mentioned by the author is that of bipolarity, so-called. I cannot recall having met with such bipolarity in my own reading or observation of religious reactions, but I am quite familiar with it in the field of sex. By way of analogy to the religious contrast you will find a good example of this mingling of attraction and repulsion in the closing scene of Shaw's "Widowers' Houses." It is a well known fact that at the time of puberty, when the attraction of the opposite sex is beginning to manifest itself, it is frequently accompanied by aversion or by its variant, shyness. Again, you doubtless know that cats and, I suppose, many other animals carry on a really violent quarrel before and during the act of coitus.

As for Stekel's accusation of neurosis against the type of atheist that takes delight in ridiculing the idea of God, I know of such individuals more from hearsay than from experience, yet I do not find their conduct so far from the normal as he does. They seem to me concerned in holding up to scorn not so much the Deity as the deists, and contempt for one's opponents is unfortunately a very general quality.

As for the retention of habits of prayer as rudiments of infantile religious beliefs, I do

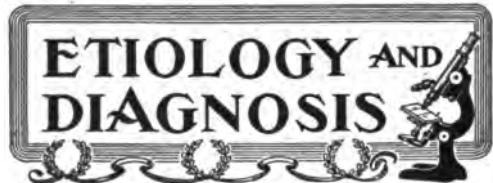
not agree with the writer when he offers this as a symptom of neurosis. I once heard of a specimen of the common or garden variety of atheist—his name, I believe, was Harris—who was overtaken by a number of misfortunes, and who cried out at his daughter's grave, "Oh Gott! was hast Du mir getan!" These words were evidently a reversion to early training—a stereotyped form of expressing certain emotions. To interpret them literally would be as ridiculous as to identify "God damn it!" from the mouth of a West Street teamster with the same sentiment when uttered by an ancient Hebrew prophet.

The instinct which leads to expressions of awe and wonder is the next thing that falls under Dr. Stekel's eye, and here I must arise and cry out, for I feel that he hits me. The religious instinct is, I believe, universal. Atheists do not object to the appreciation of man's insignificance and Nature's greatness. (Of course this is not to be taken too literally, for in many respects man is sufficient unto himself.) The peculiar bane of the atheist is the injection into religion of the element of supernaturalism, with the inevitably concomitant hocus-pocus of priesthood. The feeling of awe is a natural and in many respects, a useful one. It can be applied, in the individual, to the production of efforts to better himself and aid his fellow men.

I shall not take up the therapeutic aspect of the subject, first, because I know nothing about it, and second, because I do not doubt that in this field the author knows what he is talking about. But let me call to your attention a few minor points of the sort that mar one's pleasure in reading such an essay as Stekel's. On page 160 of the translation, the translator, evidently paraphrasing, says: "By the *hypnagogic state* is meant the condition of half sleep which immediately precedes sleep; when the person has stopped to think and is just falling asleep." I am sure he means "ceased to think" or "stopped thinking," which quite alters the sense, making the whole inconsistent. He is clearly influenced by a German phrase such as "aufhören zu denken."

The conclusions which I draw from Stekel's article are that, just as an insanity expert can prove the existence of insanity in all the world except deponent, so a pathological psychologist of the allied type of the author can prove everyone neurotic, provided we accept his definition of what constitutes a characteristic neurosis. Probably most or all of us are to some extent neurotic. As in insanity, an arbitrary limit must be set, beyond which the individual cannot go without being designated as clearly diseased.

CARL SCHLOSS.



**The Intestine as a Pathway of Infection to the Tubercle Bacillus, with Special Reference to the Part played by Enteritis.**—Under the above title, Dr. Leonard Finlay, (*The Medical Press*, Oct. 29, 1913) Assistant Professor of the Practice of Medicine, University of Glasgow, describes some experiments, to settle the question as to whether the healthy mucosa of the intestine was penetrable by tubercle bacilli and whether the frequent attacks of enteritis in childhood increased that penetrability to any marked degree. Both human and bovine types were used, and the cultures were introduced by stomach tube in a gelatine capsule to avoid insufflation tuberculosis which occurs when an emulsion is introduced. When cultures were introduced into the intestine by an operation, the wound always became tuberculosis.

*The conclusions drawn from the experiments were:*—1. Healthy rabbits can be infected by the ingestion of large amounts of bovine tubercle bacilli. 2. The bacilli can pass through the apparently intact intestinal mucous membrane and reach the mesenteric glands within a period of six days; this, however, does not frequently occur. 3. When infection occurs, the intestine is invariably the seat of lesions, and thus tuberculosis of any organ, other than the intestine, is always a secondary infection when the bacilli have entered by the intestinal route. 4. Catarrh of the intestine does not favor the passage of the tubercle bacillus through the wall, but allows of a more constant and also of an earlier and more widespread infection of the bowel, and in this way facilitates dissemination. 5. Healthy rabbits can be infected by the ingestion of large amounts of the human tubercle bacillus. 6. Rabbits just recovered from intestinal catarrh develop tuberculosis more easily and much sooner after the ingestion of human tubercle bacilli. 7. With the human type of organism, a local lesion, though always present, may be slight in comparison with the deceased foci in the mesenteric glands and lungs. 8. In digestion experiments with the human type of the bacillus, it would seem possible for the local lesion to heal and all trace of the portal of entry to be lost. 9. It would seem that the best means of combating the spread of bovine infection in childhood, so long as the removal of the source is not tackled, is the avoidance of everything likely to cause intestinal catarrh, and the use of sterilized milk."

We cannot help remarking that this seems to settle the question of the possibility that children may become infected this way. It has long been known that in tubercular enteritis of

infants, there is generally a history of open tuberculosis in some member of the family. It does not settle the question as to how the rest of humanity become tuberculous. The large number of cases in which active tuberculosis follows enteritis may not be due to a new infection, but be an activation of an old lesion through loss of immunity from defective nutrition.

**How Dangerous is a Consumptive?**—The following resolutions were passed at the annual meeting of the Chicago Tuberculosis Institute, January 29, 1914. Resolution Number 1:—

WHEREAS, the Journal of the American Medical Association, in the issue of January 3rd, 1914, published on page 45 an extract from the paper "Allergy and Reinfestation in Tuberculosis" by Dr. E. R. Baldwin of Saranac Lake, which reads:

"Finally, as a corollary, adults are very little endangered by close contact with open tuberculosis, and not at all in ordinary association. Childhood is the time of infection, youth the time of superinfection, and that from extension of the primary disease. Qualify these statements as we may, it is time for a reaction against the extreme ideas of infection now prevailing. There has been too much read into popular literature by health boards and lectures that has no sound basis in facts, and it needs to be dropped out or revised. More protection of children and better hygiene for adults are logically demanded, but beyond this the preachments about the danger of infection to adults in the present state of society are without justification from an experimental standpoint."

AND WHEREAS, in its issue of January 23 the "Christian Science Monitor" of Boston, Mass., in quoting the above extract, has mutilated the subject matter by leaving out the words: "Childhood is the time of infection, youth the time of superinfection, and that from extension of the primary disease," and again "More protection of children and better hygiene for adults are logically demanded," and

WHEREAS, the publication of such garbled and mutilated statements purporting to have the sanction of the medical profession cannot but be detrimental to the public health when put forth by irregular "healers," nostrum vendors and medical charlatans; therefore be it

RESOLVED, By the Chicago Tuberculosis Institute, in annual meeting assembled, that we deem it essential to the prevention and control of tuberculosis, to continue to urge the importance of all possible prophylactic measures against tuberculosis, and be it further

RESOLVED, That we characterize the printing of such mutilated quotations as paramount to falsification.

#### Resolution Number 2.

WHEREAS, publicity has been recently given to an article by Dr. E. R. Baldwin, entitled

"Allergy and Reinfection in Tuberculosis," in which is emphasized the slight danger of infection to adults through ordinary contact; and

WHEREAS, the lay press in printing extracts from this article has minimized or ignored the danger to children; and

WHEREAS, the present accepted rules of prophylaxis are of great moment in preventing the infection of the young who are in close proximity to consumption; therefore, be it

RESOLVED, That we, members of the Chicago Tuberculosis Institute, in annual meeting assembled, do consider it most important to continue the strict prevention measures now in use in order that the young may be protected and the propagation of tuberculosis stopped.

[We cannot help calling attention again to the report that no cases of tuberculosis have developed in the families of consumptives living in the model tenement built in N. Y. City especially for them.

The Chicago Tuberculosis Institute is still magnifying the danger in case of those living a normal life. On the other hand they have not properly emphasized the extreme danger to children living with consumptives in insanitary dwellings, nor the almost certainty of a serious or fatal termination if an infant is in close or prolonged contact with an open case even in surroundings which are otherwise ideal. Whether we can eliminate tuberculosis seems now as hopeless as eliminating the colon bacillus or the mouth flora. Like every other sanitary rule, the isolation of consumption must be interpreted according to circumstances. Ed.]



**The Use of Iodine in Abdominal Surgery.**—In the last few years, since the work of Cannaday, a member of this association, and particularly since the classical paper of Grossich which appeared in 1908, surgeons generally in abdominal as well as other work have come gradually to the use of iodine in the preparation of the operative field. The value of iodine as an antiseptic is undoubted, as numerous experiments in the laboratory and its practical use have shown, and likewise its usefulness in surgery is unquestioned. In emergency surgery it is believed to be the best of all antiseptics, possessing a value which is inestimable.

This drug is very irritating to the normal peritoneum producing destruction of the endothelium with an invariable and constant adhesive peritonitis. This was demonstrated by experiments on eleven dogs, the amount of

tincture used varying from  $\frac{1}{8}$  c. c. to  $\frac{3}{4}$  c. c. per kilo of weight. In large quantities, from 2 to 5 c. c. per kilo of weight, death ensued almost immediately from shock, and in every instance the tissues were dehydrated, presenting the appearance of having been exposed to intense heat; in other words, they seemed to be charred.

In the largest non-lethal quantities, that is 1.25 c. c. per kilo of weight, we found evidences of tremendous irritation, there being in every instance a great extravasation of serousanguineous fluid. The blood-vessels, mesentery, omentum and intestinal tract were markedly congested and distended with blood.

Pure iodine in quantity equal to the amount contained in 1.25 c. c. of the tincture did not produce death in experimental animals, though the result to the peritoneum was deleterious. In each instance where it was used there were found postmortem dense adhesions with some of the iodine unabsorbed and easily recognizable in the walled-off areas.

From our work experimentally and from our clinical observations with iodine in the preparation of the field for abdominal operations, we would conclude, that though Tr. iodine is effective as a means of sterilizing the skin it has its advantages:

That should the intestines come in contact with the iodine, adhesions will undoubtedly take place in the area thus exposed, due to the action of the iodine as an irritant to the peritoneum;

That when Tr. iodine is used as a means of preparing the field, the utmost care should be taken to avoid such contact by protecting the field beyond the abdominal incision by means of moist pads securely fixed in place;

That under no circumstances should iodine or its tincture be poured into the peritoneal cavity;

In the normal peritoneal cavity iodine in alcoholic or aqueous solution is in sufficient quantity distinctly toxic.

**The Vaccine Treatment of Typhoid.**—A great many physicians are now using vaccines in the treatment of typhoid fever. Dr. Charles W. Lüders reviews the subject in *The Therapeutic Gazette* for Oct. 15, 1913. The general trend of opinion is to the effect that it is a safe and beneficial method. The fever is reduced, its duration shortened and complications, relapses, sequelae and death rate lessened. The dose varies from 10 to 300 million, and the frequency from one to several days according to age, reaction and course of the disease. Chantemesse of Paris has recently reported phenomenally good results. Lüders comes to the following conclusions:

1. The excessive increase in immune bodies of protective substances found in the blood of patients undergoing treatment with typhoid vaccine affords a sound basis on which the principles of vaccine therapy rest.

<sup>1</sup>Dr. Louis Frank, Louisville, Ky., Amer. Jour. of Obstetrics, Nov., 1913.

2. The negative phase, or increased susceptibility following vaccine inoculation, except in excessive doses, has been proved not to be a factor in typhoid therapy.

3. The fact that vaccines in quantities sufficient to stimulate an increased production of immune bodies can be injected subcutaneously into typhoid patients without aggravating their toxic condition is another strong basis founded on clinical experience.

4. This method is without danger when administered by those with a technical knowledge of immunology and the facilities of studying the amount of protective substances in the blood. The measure of the bactericidal power of the blood should be estimated in addition to the agglutination test, in basing properly one's knowledge of the efficacy of this therapeutic means.

5. Autogenous vaccine is the proper and most scientific method of vaccine administration. A good stock vaccine of single or inclusive strains should be used as soon as possible after diagnosis, until an autogenous vaccine is obtained. The sooner the injection, the shorter the duration of fever and the milder the attack has been found to be.

6. In putting vaccine therapy to the test it is best to take a middle ground between radicalism and empiricism on the one hand, and conservatism and purely scientific endeavor on the other.

7. The results so far obtained tend to show that vaccine therapy in proper hands lowers the death-rate, diminishes relapses, lessens complications, and has proven to be of value in the treatment of typhoid carriers.

**The Value of Antitoxins in Other Diseases than Diphtheria.**—In an admirable paper on Serum Therapy, A. M. Lee (*American Jour. of Clin. Med.*, May, 1914) outlines the fundamental principles underlying the preparation and use of the serums. In referring to tetanus antitoxin the writer calls attention to the great importance of prompt administration.

Owing to the peculiar action of the tetanus toxin, the curative effect of the antitoxin is not as great as that for diphtheria. However, if given before tetanic symptoms become visible, it will, in the majority of instances, save the life of the patient.

The practice of injecting tetanus antitoxin in all cases of suspicious wounds is highly commendable. One should not convey the idea, however, that its curative value is unworthy of consideration, for in many instances it has been used in advanced cases of tetanus, with extremely good results.

Within a few years, Flexner and Jobling have prepared a serum for meningitis. This is produced by injecting a horse, first with killed meningococci, these, after a time, giving place to the live bacteria and, eventually, to an autolysate. This serum contains opsonins and agglutinins, as well as immune bodies specific for the meningococcus. To administer this serum,

a quantity of the cerebrospinal fluid is drawn off by means of lumbar puncture, and a similar amount of the serum is injected into the canal.

Unfortunately, this rather delicate operation requires considerable practice and surgical skill. Not only must great care be exercised in introducing the needle into the spinal canal, but also it is essential that the amount of serum injected be almost identical with the amount of fluid drawn off. This antimeningitis serum has been found of considerable therapeutic value, having greatly reduced the mortality from meningitis.

In a similar manner as for the foregoing, specific serums are being prepared for gonococci, staphylococci, streptococci, pneumococci, and like infective germs, all of which have been found serviceable.

So far no method of standardizing these through which the diphtheria and tetanus antibodies, has been found, although their opsonic value may be determined; neither has any satisfactory refining process been worked out. Since not only the specific antibodies but also the opsonins and the agglutinins are required to produce the desired effects, the refining of these sera presents a more difficult problem than that for diphtheria and tetanus.

It might be said that these remedies are, at the present day, passing through the stages through which the diphtheria and tetanus antitoxins passed some ten years ago. Although we still have much to learn regarding them, at least we know their value and can use them intelligently.

In addition to the sera already mentioned, a specific antitoxin is being made for snake poisoning, which has been used with very gratifying results and is in some demand in snake-infested countries. Also a pollen-serum, used in the treatment of hay-fever has been found effective in some instances.

**Treatment of Acute Abdominal Cases in Children.**—J. P. Lockhart Mummery repeats the well-known surgical advice to operate as soon as any serious intra-abdominal lesion is diagnosed (*British Journal of Children's Diseases*, February 1913). The common acute abdominal conditions in children are: (1) Intussusception; (2) acute appendicitis; (3) acute obstruction. Intussusception usually occurs in well-nourished children, is always very sudden in onset, and most generally can be diagnosed by the apple-jelly stools. The operation should be carried out forthwith and be carried through rapidly. Children should not, after operation, be kept on starvation diet, nor should they be restrained from moving about in bed. Mummery has not met with appendicitis under five years of age; it is, however, not so rare in infants as he believes. There is, in his opinion, nothing to justify delay in operation. "The important factors in performing the operation are: to be as rapid as possible, to handle the intestine very lightly, and to get the child back to bed as soon as possible." After operation he adopts the Fowler position, has a belief in the

value of small doses of brandy (preferably by enema) and has found the hypodermic injection of pituitary extract most useful by causing peristalsis of the bowel and increasing the blood pressure.

**Infections of the Hand.**—Dr. Irving S. Haynes gives a timely warning as to the treatment of infected wounds of the hand. (*N. Y. Med. Journal*, Nov. 29, 1913). Every little while we learn of the death of a surgeon from a needle prick received during an operation, and it would be well to repeat his warnings over and over again. He gives excellent advise as to treatment but his preventive advice is the best. He says:

"After many years' experience with such cases, I feel that the burden of my message is—*instant, intelligent, and thorough first aid treatment.*

A word to a colleague who pricks his finger at an operation. This is based on my own experience covering many years. Stop work at once; your assistant can attend to the patient for a few moments. Whip off your rubber glove and use it as a Martin bandage to drive the blood from the web to the end of the finger. Force free bleeding; from three to five minutes will be sufficient. Dry and apply tincture of iodine. Put on a clean glove and finish your operation."

the substances that are efficacious in gynecologic conditions, led C. P. McCord, Detroit (*Journal A. M. A.*, April 18), to undertake an investigation of the frequency of pregnancy in the slaughterhouse animals from which the corpus luteum extract used in organotherapy is obtained. There is no anatomic difference between the corpus luteum of pregnancy and that of non-pregnant animals, whatever differences exist probably involve the chemical constituents rather than the anatomic structure. He found that the greater number of cows slaughtered in the packing houses from which the corpus luteum supply is obtained were mostly range cattle where the females and males run together. The greater number are at some stage of pregnancy. In forty cows examined, thirty-five yielded ovaries containing corpora lutea of such size as permitted dissecting out. Of these thirty-five, twenty-nine, or 83 per cent., were pregnant. Allowing this to be the usual figure, on account of the larger yield of corpus luteum from a pound unit of ovaries from pregnant animals, the proportion by weight may run much higher, even to 90 or 95 per cent. of corpus luteum verum. The figures may vary with an examination of a larger number of cattle and furthermore a seasonal variation may alter the percentage of pregnancies, but if the above data at all approximate the general conditions, all corpus luteum preparations are derived in a large percentage from pregnant cattle.

**The Management of Osteoarthritis.**—In an interesting and comprehensive article Dr. P. W. Roberts (*Med. Record*, May 9, 1914) states that the conclusions which his experience suggests are as follows:

1. Regardless of their etiology, a majority of sufferers from progressive osteoarthritis may be relieved by the use of glandular preparations, rest, and such local measures as have been indicated in the foregoing paper.
2. A diagnosis of osteoarthritis may be established before the stage of deformity has been reached.
3. In discussing treatment, the element of time should be clearly understood by both physician and patient. Rapid results are seldom attained.
4. Rest or complete immobilization of affected joints is an essential factor in the treatment of pain.
5. Contracture deformities of the knees and ankles should always be corrected.
6. Innovations in treatment and the hobbies of a single investigator should be avoided by the general practitioner until their value has been proved.
7. A case not entirely ankylosed should never be considered hopeless.

**Crotalins (Snake Venom) in the Treatment of Epilepsy.**—Yawger (*Jour. A. M. A.*, May 16, 1914) gives a report of his experience with crotalins and says two patients were uninfluenced; two were worse during the treatment; one, early in the course developed such intolerant toxic symptoms that further experimentation was unjustified, and the last patient died two and a half months after treatment. While he did not feel that death resulted from the use of crotalins, the patient's disease certainly was not benefited by the treatment.

**Mushroom Poisoning.**—An emetic is useless if the poison has been acting for several hours.

1. Use some stimulant, as strong coffee, hot bags to the surface, and friction.
2. Give some purgative, preferably castor oil, which does not dissolve the toxic principle of the mushroom.
3. Give large quantities of milk to cause diuresis.

In case of continued vomiting, ice may be given. For acute mushroom poisoning, vomiting should be established by tickling the throat or by swallowing large quantities of soapsuds or tepid milk. Hot bags and friction are important.—*Life and Health.*

**Corpus Luteum Extract.**—Dannreuther's assertion that only corpora lutea vera contain



**The Long Island College Hospital.**—Long Island College Hospital, Brooklyn, has undergone complete reorganization in order to meet the modern requirements of teaching medicine. It has instituted a five year course to take effect in September of this year, and has arranged to add over twenty fulltime members to its faculty and every department has been increased. The junior year will be given over to dispensary work and didactic medicine and surgery, and the senior year will be devoted entirely to bedside work in the hospital owned by the college, which with the new addition, will give the institution 560 beds and make it one of the largest in Greater New York.

The following gentlemen will occupy the new positions on the faculty:

Dr. Archibald Murray, Professor of Pathology.

Dr. William Lintz, Professor of Bacteriology.

Dr. John C. Cardwell, Professor of Physiology and Pharmacology.

Dr. Matthew Steel, Professor of Chemistry.

Dr. William Francis Campbell, Professor of Surgery.

Dr. William B. Brinsmade, Professor of Clinical Surgery.

Dr. Joshua M. Van Cott, Professor of Clinical Medicine.

Dr. E. H. Bartley, Professor of Pediatrics.

**American Medical Editors' Association.**—The 1914 meeting of the American Medical Editors' Association was held at Atlantic City, June 22, 1914, with the President, Dr. A. Van der Veer in the chair. An excellent program was provided and a large number of interesting papers read and discussed. The attendance was the largest for several years and the various high class medical journals of the country were well represented. The Secretary's and Treasurer's reports showed the Association to be in a most prosperous condition, with a splendid membership list including practically every prominent medical editor in the United States and Canada, and a gratifying surplus of several hundred dollars. The establishment of an official publication was credited with having materially aided in placing the Association in its present satisfactory condition. On the other hand it was recognized that the success of the official journal and the present enviable position of the Association were due mainly if not almost entirely to the untiring zeal, enthusiasm and executive ability of the Secretary-Treasurer, Dr. Jos. MacDonald, Jr. Resolutions expressing the sincere and heartfelt gratitude of the members

for Dr. MacDonald's faithful services were unanimously passed and ordered published in the official journal. The officers for the ensuing year were elected as follows:

President, Dr. H. Edwin Lewis, New York City; First Vice-President, Dr. H. D. Holton, Brattleboro, Vt.; Second Vice-President, Dr. W. M. Brickner, New York City; Secretary-Treasurer, Dr. Jos. MacDonald, Jr., New York City.

The annual banquet was held Tuesday night, June 23, at the Marlborough-Blenheim. As usual this was a most successful affair, an excellent menu and program being enjoyed by a large and distinguished party. Dr. Walter M. Brickner was the toastmaster and his clever introduction of the speakers, and delightfully humorous contributions added much to the pleasure of the evening. Among the notable speakers were Drs. A. Jacobi and H. O. Marcy, Mr. Frederick L. Hoffman, Dr. Geo. F. Butler, Judge Ingersoll, Dr. Harold Hays, W. B. Conyngham and one or two others.

In every respect the 1914 meeting of the American Medical Editors' Association was one of the most successful in the history of the organization, a result that must be attributed to the able direction of the business and scientific session by the President, Dr. A. Van der Veer, the conduct of the banquet by Dr. Brickner and the skilled management of affairs generally by Dr. MacDonald.

**Aseptic Vaccination.**—It is unfortunate that vaccination is too often deemed a trivial matter, says a writer in the *International Journal of Surgery*, when actually it should be considered as a minor operation and therefore be practiced with the same aseptic precautions as any surgical procedure. If the patient's skin and the physician's hands were always clean and the abraded surface carefully protected against contamination by the clothing, there would be few, if any, infected and ulcerated arms to furnish ammunition to the antivaccinationists, who, of course, are only too ready to throw the blame upon the virus. Every one who has passed through such an experience becomes an easy convert to their arguments and a more or less active opponent to vaccination. There are some individuals whose tissues have so low resisting power that infection may result from a mere scratch and marked sloughing may follow, if proper precautions are not taken in the way of thorough cleanliness. For this reason, if for no other, any extra time spent in making the technic as aseptic as possible is time well spent, and will serve to divest vaccination of much of the prejudice entertained against it on the part of some persons.

**Dr. Register Honored.**—At a recent meeting of the Tri-State Medical Society of the Carolinas and Virginia, Dr. E. C. Register, who has been editor of the well-known *Charlotte Medical Journal* for twenty-five years, was elected president.

# American Medicine

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EDITED BY

and

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PUBLISHED MONTHLY BY THE AMERICAN MEDICAL PUBLISHING COMPANY.

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Complete Series, Vol. XX, No. 7.  
New Series, Vol. IX, No. 7.

JULY, 1914.

\$1.00

YEARLY  
in advance.

The alleged immortality of living substance is being discussed and believed although there is no evidence whatever that anything can live forever. Some trees live two or three thousand years but as far as we know there comes a time of senility when they perish. Certain plants have been kept alive artificially for several centuries by replanting cuttings, but no one yet knows whether this process can be continued indefinitely. In the vast majority of instances unicellular organisms become senile after a certain number of divisions and then cease to divide unless rejuvenated by coalescence with a similar cell. In the higher organisms the individual which protects and nourishes the rejuvenated cell must specialize for the duty—and this is sex differentiation. Jacques Loeb has shown that certain low forms of life which ordinarily depend upon sexual reproduction, can be made to reproduce without the male (parthenogenetically), but he has not shown that this can be done indefinitely. In nature parthenogenesis must alternate with sexual reproduction. Carrel has been able to keep animal tissues alive and make the cells reproduce themselves for awhile outside of a body which can make the same cells do it for a century or more. This achievement of the laboratory has been incorrectly heralded as an evidence of tissue immortality, but he has only suc-

ceeded in doing outside of the body what normally occurs in it. It is yet to be proved that we can prevent senility and prolong the reproductive capacity of cells indefinitely.

The explanation of senility is yet to be made but there have been one or two very rational attempts. Studies in multi-cellular organisms seem to show that the necessity for coalescence with a similar cell is a species of hunger from partial starvation, and that by varying the nutritive medium the necessity can be delayed or hastened. It is reasonable to assume that in the beginning of primitive beings those unicellular organisms, which in times of stress took on the habit of absorbing or engulfing one of their own kind, had a supreme advantage over the rest and could stand the adverse medium long after the others had perished. It was not entirely unlike cannibalism which is so common among higher carnivorous animals and primitive men. The universality of the custom may mean that it has somehow been beneficial in species survival to supplement the damage of a continuous diet which is defective in some element. The prevention of senility and the preservation of individual vigor are apparently the same thing, and the general trend of thought is in the direction of considering the matter largely though not entirely dietary. That is,

if we can supply the cells of multicellular organisms with proper nourishment we can prolong their juvenile state as we do in the experiments with unicellular organisms. Of course we must prevent those abnormal chemical changes of digestion and metabolism which in time cause those tissue changes commonly called senile. They are not really evidence of senility but of disease and may occur in the young.

**True senility** seems to be a result of improper nourishment. On the face of it, therefore, it does seem reasonable to suppose that living tissue is essentially immortal. Certainly the present day forms of protoplasm are the lineal descendants of the most primitive simple form which existed millions of years before it organized itself in cells or groups of cells. There is nothing absurd in the idea that germ plasm can survive now as in its pre-cellular primitive form without the necessity of occasional rejuvenescence by conjugation. Similarly it is not inconceivable that our body cells also can be kept in their juvenile state by a proper environment including nutrition. Metchnikoff may not be correct in his belief that we can do this for awhile now by means of our present knowledge, but he seems basically right in predicting a marked prolongation of human life. Similarly those bizarre stories in fiction of places where men could live forever, though too absurd for scientific discussion now, have a microscopic kernel of truth. It might be possible in the immensely distant future when we know all about tissue metabolism.

**The prolongation of life and prevention of arteriosclerosis** seem to be the same thing because arteriosclerosis is the most common result of senility and the ultimate

cause of death of those who escape destruction by accident or infection. The subject has assumed great practical importance now that life insurance companies have taken up the task of keeping their policy holders alive as long as possible. The "life extension" movement started in New York a few months ago is largely devoted to detecting the early signs of senile diseases so as to prevent the preventable or cure the curable. So large has this field become that physicians can specialize in it, and there is an increasing number of articles and books written upon it. The latest is the exhaustive monograph on arteriosclerosis by Dr. Louis F. Bishop of New York City (*Oxford Medical Publications*). It will repay study for he has been so successful in the dietary management of the condition that he speaks with more than the usual authority of specialists. His plan of limiting the number of kinds of protein is based on the known fact that all animals differ in their ability to digest certain proteins and that similar variations occur in man. Moreover the cells of the body may acquire a certain sensitivity to one or more proteins which then become veritable poisons, causing the numerous changes variously classed as Bright's disease or arteriosclerosis. By limiting the protein foods to casein and those in the vegetables, we cut out most of the harmful ones, or at least those which may be doing the harm in that particular case. The "proof of the pudding is in the eating" and Bishop's success certainly indicates that his theory is correct. There is more or less opposition of course, but that is to be expected. High blood pressure is ceasing to be the bug-a-boo it once was. To be sure it does indicate a rather serious condition of the circulatory apparatus but the author shows that it is compensatory and

compatible with prolonged efficiency providing one lives accordingly and prevents any increase or diminution from the optimum for that person.

—

**Prayer and suggestion in therapy** have been studied by ten British doctors and ten clergymen of the Church of England, who have come to the unanimous conclusion, that all forms of healing by faith, prayer and what not, are instances of suggestion. The committee have been investigating since 1911, and have examined very many witnesses, but in not a single instance has there been a bit of proof that an organic lesion has been cured by such means. They conclude that benefit has been obtained only in "functional disorders, as distinct from organic ailments," but do not state what the functional disorders are. The inconsistent and curious part of the report is the conclusion that when prayer is the medium of applying suggestion, there is evoked a "Divine power" which works through natural laws, and that "spiritual ministration should be recognized equally with medical ministration" as the most potent form of suggestion. This is amazing in view of their conclusion that equally good results are obtained with suggestion without spiritual means. Indeed they deprecate treatment by irresponsible and unqualified persons, and advise against postponing real treatment by scientific means. That leaves us just where we were before. The sick should consult a doctor and request him to use the means which experience has proven to be the best—whether a knife, a pill or a suggestion. The medical men on the committee included Sir Dyce Duckworth, Sir Richard Powell, Sir Thomas Clifford Allbutt and Theodore B. Hyslop. Though we must accept their word

with considerable reverence, we cannot help thinking that they have been unduly influenced by the deplorable persistence of certain clergymen who boldly intrude into work for which they have no training or knowledge. Their claims of miraculous healing power are not the less ridiculous by stating that it acts through natural means.

**The real benefit of prayer** is not mentioned in the report as far as it has been published. Everyone knows that fear, rage and all mental excitements increase the pulse rate, respiration and circulation and also increase fever through the more rapid metabolism. Under such conditions all inflammations get worse. We are forgetful of the opposite effect of calming the mental processes. Of course we put the patient to bed and remove all sources of irritation, but we neglect the means of calming the mind by prayer though its effect is a long attested fact. The committee dimly saw this when they stated that suggestion acts more powerfully in the hands of some men than in others. We all know the tremendous feeling of relief when we get the opinion and advice of those who are mighty to save. How much more quieting must it be to those who believe that they are leaving their case to one who they think Almighty to save. In view of this fact, we have always advocated the presence of clergymen in the sick room, as they are the tangible intermediaries, representing the Almighty. These facts are recognized and utilized by physicians who are themselves the veriest atheists. This is no warrant for the committee to assert that clergy and physicians are equally important in the sick room, nor that prayer is the most potent form of suggestion. Other ways may soothe the patient more and we may find that the clergymen has such an alarming effect as to

necessitate his exclusion. In moribund cases or in great shock, their presence has no effect one way or the other.

**The judicial recognition of prayer as a therapeutic measure** is the sum and substance of the affirmation by the Appellate Division of the New York Supreme Court of the conviction of a Christian Science healer, Willis V. Cole, who was fined by a lower court for practicing medicine without a license. The medical profession has no quarrel with this view of the matter and will probably disagree with the dissenting judge who decided that the acts were not practice of medicine as they were claimed to be merely evoking the power of God, "the Great Physician." It would be inconsistent in us to use suggestion and then deny the effect of this powerful suggestion. There is no legal objection to allowing any licentiate to practice Christian Science if he sees fit to do so in appropriate cases, but he must square his acts with his conscience. The only thing insisted upon by the law, is that before a person is permitted to practice any system of healing, he must prove that he has been sufficiently educated to be trusted to make a diagnosis. In that case he may also be trusted not to use Christian Science for cases in which it is inappropriate, if it ever is in any. He runs the risk of trial for malpractice if he acts like the present day healers who merely take the patient's word, go through the form of prayer and collect two dollars. It was a rather attractive and remunerative graft. The danger of spread of unrecognized communicable disease is so great, the public should be thankful the healers are now to be driven out of business. If in need of prayer, better consult a clergyman at once. If sick, call a doctor.

**The disposition of New York City's sewage** has been planned by the Metropolitan Sewage Commission which went out of existence April 30, 1914, after more than six years of painstaking investigation. They have published seventeen preliminary reports of the progress of their work and three bound volumes, the last being a summing up of the whole and constituting a monumental authoritative work. They have concluded that it is neither necessary nor practicable now to collect all the sewage for disposal at one central plant on an artificial island at sea, but that it is possible to treat it sufficiently so that it can be discharged in numerous submerged outlets in the bottoms of deep swiftly flowing channels in a condition which will not overburden the oxidizing power of the harbor waters. So they have planned for numerous grit chambers, screens, pumping stations and treatment works. They express doubt as to the success of this in the lower part of East River, where the water is limited and the sewage a concentrated one from an enormous and dense population, and have submitted an alternative plan for a trunk sewer running through Coney Island to an "outlet island" in the middle of the entrance to the lower bay. Their standard of purity for the harbor water provides that nothing of sewage origin shall be noticeable, that deposits near the outlets shall not injure navigation and that in the vicinity of docks or outlets the dissolved oxygen shall not fall below three c.c. per liter. Where bathing or oyster culture is permitted the bacterial purity of the water will be the same as for drinking water, but it is not practicable to maintain this degree of cleanliness anywhere north of the narrows or in the Arthur Kill, nor will it be entirely safe elsewhere to bathe or take oysters within a mile

of a sewer outlet. No doubt there will be much disappointment that the plans do not call for the sending of all the sewage to sea so that it will be safe to bathe everywhere in the upper harbor, but such a measure of expensive perfection is for the distant future. The Commission has prepared a plan which is practicable now, but so devised as to be easily modified to take in future discoveries and improvements in sewage disposal or send all to sea if desired. Chemical disinfection has been rejected as too expensive and offensive.

**The urgency of immediate execution of the sewage plans** is so self-evident that it is a waste of time and space to go over the matter again. The people have been convinced and will soon cry out for relief as we are the only city in the civilized world which has neither a system nor has adopted one. All the experts consulted by the Commission are unanimously of the opinion that work should be begun at once, but in a systematic manner covering the next fifteen years. The whole area to be covered includes about eighty municipalities in New York and New Jersey, and the only practicable plan is a supervisory commission composed of representatives of these states and the United States, created by appropriate general and state laws with power to compel proper action by all communities whose sewage enters New York harbor or adjacent waters. This is strongly urged in the reprint, as well as a constructing and maintaining commission for New York City, with a suggestion that the present Water Commission now coming to the end of its work, could take up the matter as it has an equipment and staff already organized. Public health demands quick action and we hope the matter will be presented at once to the

legislatures and Congress by the health authorities of the two states and the general government. The cost need not worry us, as it will be much smaller *per capita* than many a village spends, and must be covered by long time bonds which may be refunded from time to time. Statesmen and economists are no longer afraid of a public debt, as they now realize that it is more economical to borrow at low rates for permanent works than to tax our own capital which is bringing in high returns. For this reason rich nations owe enormous sums which will never be paid, but which will grow bigger with their wealth. The supervisory commission will have power to prevent the discharge of untreated sewage such as the Passaic plans contemplate and such as the Bronx valley sewer would have done if not enjoined by the courts. The report probably overestimates the future population of the district, as it is not likely that the city's future growth will be as large as the past, now that our farming land is all taken up. New York harbor is only the front door of the nation and grows with the nation. However the error, if any, is on the safe side.

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**The defectiveness of the unfortunate** is at last a matter of exact statistical investigation. Many years ago a story was going the rounds to the effect that a certain successful banking establishment of Europe never employed an unlucky man, and that if an employee did have a run of hard luck he was discharged. The house claimed that bad luck was merely the result of bad judgment or lack of forethought and that such men should not be in the banking business. Dr. Siegfried Block of Brooklyn now publishes (*Medical Record*, New York, July 4,

1914) a preliminary report of the psychology of alcoholism, insanity, illegitimacy, divorce, accidents, crime, etc., and finds that as a rule they are all largely confined to mental defectives of more or less degree. There is a close connection too with syphilis and phthisis. Referring solely to inherited traits, he believes that "an absolutely normal individual will practically never become an habitué of any drug." We might include in this generalization the cases of alcoholism and tuberculosis due to acquired faults in persons who were normal before injury by an adverse environment. In twenty-four divorces investigated there were criminals, mental defectives, etc., on one or both sides of the house, and in every case the incompatibility was due to mental defectiveness which made mountains of molehills.

**Mental defect is the cause of male inefficiency**, which leads to desertion and nonsupport. The women who are "down and out" are so defective as to be incapable of such simple work as darning or mending. Prostitutes and most criminals have long been known to be in the feeble-minded class. That accidents are related to mental defect and lack of forethought is shown by the fact that the feeble-minded usually have a large scar, often many, by the further fact that men with forethought who take out accident insurance meet with very few accidents, probably less than any other class of the population. Criminals are rarely free of scars and some are almost covered with them. Automobile accidents are now being traced to mental defect of some sort in the chauffeurs, who are either drunk or slow to decide in an emergency or lacking in forethought or judgment in taking chances. We are at last getting down to bedrock in the explanation

of unemployment and poverty. Untold tens of thousands of ineffectives are walking the street looking for work but can find nothing they can do, while tens of thousands of employers are vainly searching for competent labor. There are hundreds of thousands of housekeepers actually suffering in health because of lack of assistants, and of the hundreds of thousands of women out of work scarcely any have sense enough to take the jobs. Domestic service requires a high degree of intelligence and its remuneration is becoming correspondingly high for the competent.

**Is charity misdirected?** In December, 1913 the New York Charity Organization published the facts in 100 cases needing assistance and in every one there was more or less unfitness for the struggle for existence—generally mental and often physical. It is an appalling array of preventable accident and disease from lack of forethought, and crass stupidity. The unrestrained child bearing shows that the parents should have been sterilized, for many of the children seem hopelessly defective. They will be public burdens for life and the efforts to put them on a self-sustaining basis are bound to fail. It is remarkable that the law prevents the younger children from helping the parents and thus intensifies the results of parental incapacity. Our pedagogic cranks are responsible for this unnatural labor law. Wholesome work never injured the boys doing the chores in our colonial days. Poor families never have been able to survive without the aid of the children—even well paid skilled mechanics cannot support more than three children who are not wage earners. Every new investigation shows also that organized charity is creating future burdens by preserving ineffectives who former-

ly died out by nature's usual methods. If we must preserve them why not sterilize them? This may be shocking, but the necessity in the more marked cases of feeble-mindedness is now being recognized by far seeing statesmen both here and in Europe.

stimulants or repressives. As the cells are inefficient or materially damaged unless kept at the optimum temperature, it is of the utmost importance to keep them at that point. To this end we must know the causes of all abnormalities. Crile's conception seems to be most reasonable and we can safely predict that it will prove of great practical value in surgery and therapy.

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**The Kinetic system of the body** is conceived by Dr. G. W. Crile of Cleveland to be composed of the brain, muscles, thyroid, suprarenals and liver. In his Oration on Surgery at the annual meeting of the New York State Medical Society, he enlarged upon this conception and stated that it explained many of the puzzles of fever and subnormal temperature with and without infection. The combustible material is stored in the liver which is likened to the coal bin or gasoline tank, and the muscles are the engine or furnace for transforming the kinetic energy into motion and heat, the brain being the starting mechanism and the thyroid and suprarenals regulators. There is an enormous amount of information yet to be worked out, but enough is known from the special experiments of Crile and his co-workers to justify some such generalization. Physiologists have given us a rather hopeless feeling as to the possibility of finding out how combustion takes place and is regulated, though perhaps a true scientific conservatism has led them to suppress their own true hypotheses. We might know far more about it than we think we do. So it is time now for the construction of the theories which can be modified from time to time to cover new facts. The toxins of pathogenic organisms are generally considered the only causes of excessive combustion, but it is quite likely that our own internal secretions may be equally powerful

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**The small medical college** is again up for discussion because of a report (*Journal American Medical Association*, May 23, 1914) that as a rule the larger the college the higher is the percentage of its graduates who fail before the State Examining Boards. The cause of the phenomenon is thought to be the inadequacy of the teaching staff of the large colleges which makes it impossible to give sufficient individual instruction to each student. This is undoubtedly true, and fully accounts for the remarkable careers of many men who have been turned out of institutions notoriously lacking in equipment. We have often called attention to this phenomenon as well as the parallel in academic colleges, and have often advised that young men be induced to matriculate in small institutions instead of the big ones where they might be submerged and neglected. The staff automatically enlarges with the number of students but this throws the teaching into the hands of the young and inexperienced and possibly the inefficient, while in the small college more of it falls to the professor of recognized ability. The mere enlargement of the faculty does not therefore suffice, and in medicine enough teaching material may not be in the locality. A city of moderate size may furnish plenty of talent for a small college, and such insti-

tutions should therefore be encouraged. They are doing better work than the big ones and could do still better with a bit more equipment furnished by local public spirited rich men. Yet after all is said, success depends on the brains in the student's skull. Good or bad teaching merely makes the student more or less successful than he would be with mediocre teachers.

less lesions from causing consumption. AMERICAN MEDICINE has been preaching from this text for a long time now, and we have been like a lone prophet calling out in the wilderness. Perhaps we have helped to induce Sir William Osler to speak out.

**The unrecognized cases of peribronchial phthisis** were described in *The Practitioner* of February, 1912, by Dr. Alfred C. Jordan, Medical Radiographer for Guy's Hospital and the Royal Hospital for Diseases of the Chest. Although his publication is over two years old, it is very timely to us here in the United States where these incipients have assumed an importance owing to the possibility that they may be made worse by other infections or by vaccines of one kind or another. Jordan finds that most cases of phthisis begin at the roots of the lungs and extend along the larger bronchi, and that it is not true, as usually taught in the text-books, that the first lesions are near the extreme apex of the lung. A little more than 20 per cent of cases are purely apical, and nearly 40 per cent are purely "peribronchial" and in nearly 40 per cent of early cases the lesions are found in both apex and root. The significance of the report is in the fact that the peribronchial infection gives no sign or symptom of its presence until it is quite well advanced, and as a result fully forty per cent of cases of pulmonary phthisis cannot be detected by the ordinary means at the hands of practitioners. The X-ray alone will reveal the lesions and it requires great practice to detect them. Hamburg reported post-mortem findings of tuberculosis in 77 per cent of children between 11 and 14 years, and by using Escherich's very delicate modification of von Pirquet's test he got a positive reaction in 94 per cent of all children of the

**The universality of tuberculosis among adults** is about accepted as a proved fact, but all the anti-tuberculosis crusaders do not seem to know it. The newspapers report that the British National Association for the Prevention of Consumption had not heard of it. At their July meeting in Leeds, the delegates were considerably startled when Sir Wm. Osler told them that practically all human beings are infected by the time they reach adult life, and that probably 90 per cent of his hearers still had lesions. We are much afraid that our own anti-tuberculosis workers are still in more or less ignorance. Their literature harps upon the ways of avoiding infection, whereas we are infected already. The consumptive with open lesions is perfectly harmless to us, though he is liable to kill our babies if he comes in close contact with them for they have not yet acquired the immunity we have. The anti-tuberculosis movement is evidently misnamed, as we cannot prevent universal infection and should not if we could, as our tiny lesions seem to be constantly immunizing us. It should be called the anti-consumption crusade. They should abandon the useless if not quixotic battle with imaginary windmills of infection dangers, and devote their whole energies to teaching people how to prevent the harm-



DR. GEORGE W. CRILE.

*Awarded American Medicine Gold Medal, 1914.*

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above ages. Naegeli found post-mortem evidence of tuberculosis in 97 per cent of adults. Jordan himself X-rayed a number of "healthy" lungs from the post-mortem room and found calcareous glands at the roots or along the larger bronchi in practically all. Though it is quite evident that few if any of us have "healthy lungs," it is right to say so because in only a few does the disease give any sign of its presence throughout a long life. The danger is in the fact that in the few who lose their power to keep the bacilli in check—10 to 16 per cent. of us—the process may go to the incurable stage of a massive fibroid condition at the root before detection is possible by physical signs. Sometimes a few dry or moist rales may reveal a superimposed bronchitis, but that is all we can learn, as the superficial lung is healthy. Phthisiographers, who have been in the habit of pronouncing lungs "healthy" because of the absence of signs of "moisture," must not be so positive until an X-ray examination is made. Jordan says the X-ray is the only way of making an early diagnosis. If we cannot send a suspicious case to a radiographer it is far better to institute proper living at once. If the man gets well and lives to 70, the uncertainty as to what had ailed him will not worry him. Maurice Fishberg has explained the sources of error in the diagnosis of pulmonary tuberculosis (*Medical Record*, New York, July 4, 1914) but we wish he had emphasized the fact that in the early stages it is unrecognizable by any means, a little later only the X-rays can reveal it—even they may deceive us—and only in the moderately advanced are there signs and symptoms.

**The dreadful prevalence of active tuberculosis** is shown by the statistics of the Local Government Board of England.

In every thousand of the general population 3.06 have tuberculosis of the lungs as compared with 2.98 cases of scarlet fever, the next most prevalent disease on the notifiable list. If we add the cases of tuberculosis of other organs and the incipient unrecognized apical cases and the unrecognizable peri-bronchial ones, it is safe to say that close to two per cent of the population harbors active lesions. The present problem is to find out what has happened to make them victims of parasites they might have carried harmlessly through life. Of course there is a mass of observations of this sort and we know quite surely many of these harmful factors, but we have made quite a number of errors in the interpretation of our observations, and we are still far from being able to put our fingers on the causes in each individual case. There is an enormous amount of work to be done in carefully analysing the facts already recorded, and scarcely a soul has attacked the problem of finding out why the ninety and eight have so far been able to dodge or resist the adversities which felled the two per cent. There is reason to believe that in American cities considerably more than two per cent have active lesions—possibly three—for in a few more years 8 to 15 per cent according to circumstances will become actively tubercular and die of it. It is almost a byword now that anything which injures health in any way whatever, may allow a latent lesion to become active and destroy us. For instance, syphilitics and diabetics have more tuberculosis than the rest of the population and perhaps this rule follows in every disease, the leading ones being typhoid, measles and whooping cough. We cannot avoid all the adversities so that a certain small percentage cannot escape death by tuberculosis, but perhaps 95 per cent can and we must

learn how to do it. It is now proved that a climate against which we have no natural guards is a most potent cause of tuberculosis as among northern people in the tropics or negroes in cold places. We can protect ourselves somewhat by artificial means and we can tell people not to be too strenuous for the almighty dollar in places for which nature did not design their physique, but to be content with better health, longer life, better work and more work in the hands of their ancestors even if they have less money. When we send invalids in search of a more suitable climate, let us suggest one like that of their ancestors. We can do a lot of good by finding out what makes a man lose his immunity to tuberculosis in America.

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**Professional jealousy** ought to be above great men but it isn't, and perhaps jealousy stamps a man as of such small calibre as to be unable to compete with those whom he tries to suppress in other ways. We are led to make these platitudes because we have heard ugly rumors that the exclusion of Dr. Plotz's typhus paper from the program of the meeting of American physicians was at the instigation of a rival research worker. This has always been the history of the attitude of leaders towards youthful discoverers, but we somehow feel ashamed that the persecution should be so near home. The usual excuse is to the effect that medical innovations should first be given to a body of experts who can discuss it to eliminate errors which would deceive the public, but is this a fact as to any paper thus presented? Is there not an endless succession of ridiculous things presented to medical societies, made a fad for a while and then dropped? Is it not impudent for any

society to assume that it is more competent to judge of a discovery than the discoverer himself? It is certainly high time that we throw off the smug mask of hypocrisy and modify our ethical standards to a closer agreement with modern needs. The printing press was not even a dream when the Hippocratic oath was evolved.

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**The flannel binder to prevent bowel infections in the tropics** is an old theory which seems to be attracting favorable attention again though it was abandoned by the English as soon as they found out the real infective causes of intestinal disorders. The Americans in the Philippines have found it of doubtful use if any at all, and it is rarely used now though in the early days of the Philippine occupation untold thousands of them were sent over as part of the soldier's equipment. If the bowel can be inflamed by chilling the skin with cold air, surely it will be worse inflamed by cold water, yet the very men who advise keeping this part of the skin warm will advise cold baths. We are therefore somewhat surprised that the French should be taking up the discarded flannel binder and advising its use by all Europeans in hot countries. The wearers will find that the skin under the binder will be kept wet and soggy, and develop heat rash and pustules. Besides all this, it is an axiom of tropical hygiene to wear no wool next to the skin. No animal which is normally clothed in wool has any sweat glands, because the greasy wool is designed to keep the skin dry in wet and cold climates. Under clothing must be of material like cotton or linen which will carry the skin moisture to the surface for evaporation. The flannel binder prevents this as

well as keeps the body too hot. As it never prevents one swallowing the germs of cholera or dysentery, it ought to be abandoned in spite of French endorsement. The theory is a very old one. As far back as 1832, General Scott's troops in the northwest were attacked with cholera and he issued an order stating that "the senior surgeon present recommends the use of flannel shirts, flannel drawers and woolen stockings, but the commanding general, who has seen much of the disease, knows that it is intemperance which, in the present state of the atmosphere, generates and spreads the calamity."

**The immunity conferred by typhoid vaccine** is more or less effective in the vast majority of persons to whom sufficient is given, though it generally fades in less than two years, sometimes in a few months. If a person is very susceptible to typhoid, it is not to be expected that these comparatively few dead bacilli will overcome such a handicap, and we have mentioned that fact to emphasize the necessity of sanitary precautions whether one is vaccinated or not, for no one knows how susceptible he really is. New York *Life* has quoted us indirectly from *Literary Digest*, as saying "The British Army authorities have concluded that typhoid vaccine confers no protection to those who are specially susceptible to typhoid fever." Without further explanation this extract gives the unwarranted impression that the vaccine is no good whatever, whereas it is of great value in appropriate conditions. *Life* further quotes, "In the meantime, the tremendous strides made by sanitation began to show results (in the Army) which were also erroneously attributed to the vaccine. This

is a serious matter, since it intended to discredit the means which have so markedly reduced typhoid fever elsewhere." Taken by itself, this implies that sanitation is solely responsible for the reduction of typhoid fever in our army and in the British East Indian forces, a position as extreme as that of the vaccinationists who claim all the credit. We take this opportunity to repeat that vaccination should be resorted to when we know we will be exposed to infection and unable to avoid it where sanitary laws are being violated by those who supply us with food and drink. Where there is only an extremely remote chance of infection, the vaccine is as unnecessary as antitoxin would be in the absence of diphtheria.

**The contraindications to typhoid vaccination** might be emphasized a bit more by the vaccinationists instead of the unwise statements of its invariable harmlessness. Enough disasters have followed it to show that it should be omitted when there is the slightest suspicion of concealed or chronic disease, particularly tuberculosis. The article by Professor Zueblin in this issue shows that both typhoid fever and typhoid vaccine might activate lesions which have begun to spread in persons who are losing their normal immunity to tuberculosis. Dr. Russell of the Army says:— (*N. Y. State Journal of Medicine*, July, 1914) "A fear has been expressed that antityphoid vaccination may light up a latent tuberculosis. Our statistics show that not only has the steady decrease in the number of cases of tuberculosis in the army been maintained but that the decrease in the number of cases has been more rapid since the introduction of compulsory vaccination." The vaccine was in

roduced in 1909 but did not become universal until late in 1911, and the Surgeon General reports the following incident rate per 1000 soldiers for tuberculosis of the lungs from 1890 to 1912—3.55, 2.93, 3.27, 3.28, 2.96, 2.42, 3.24, 3.21, 3.70, 3.98, 4.92, 4.59, 4.38, 3.89, 4.26, 4.22, 4.50, 4.59, 3.81, 4.00, 3.12, 3.13, 3.08. The evanescence of the immunity conferred by the vaccine, its failure in the susceptible and the occasional disasters to the sick, show that it can never eliminate typhoid fever from civil communities no matter what it does to healthy soldiers or nurses. Here sanitation is our sole dependence in prevention.

board of them to examine into the cause of death in all cases in which a physician has not certified the facts, or in which murder is suspected. The plan will permit the board to summon witnesses and seems to be practicable and economical. It will make the "coroner's quest" as valuable as originally. After the cause of death is determined the matter is ended. If violence is proved, the police must find the culprit. They do that now anyhow and the coroner's work is useless.

**The movement to abolish coroners** is taking shape all over the country, at least medical men are thinking in that direction. The "coroner's quest" was a very necessary thing before the days of scientific medicine, and when death by violence was a common danger. The "crown," which means the people made an inquiry, and various means were taken to determine the cause of death. A layman could do that as well as a doctor, but now it is different. To determine the exact cause of death, the coroner finds it necessary to employ experts to decide the matter for him. There is then no longer any reason for the existence of the lay coroner, who in time will be replaced by a medical examiner. The coroner's jury will be abolished as a useless expense, for it returns a verdict as instructed. The details of the exact relationship between the medical examiner and the police department and district attorney will have to be worked out according to local conditions. The main point is to have a skilled pathologist or a

**The wild monkey as a reservoir of yellow fever** is discussed by Dr. Andrew Balfour, Director-in-Chief, Wellcome Bureau of Scientific Research (*Lancet*, April 25, 1914) who accidentally learned that the negroes of Trinidad had a belief that prior to an outbreak of yellow fever, the red howler monkeys were found dead or dying in the neighboring woods. Balfour has unearthed some facts which could be explained on the supposition that the organism existed in monkeys and only occasionally killed them when perhaps their normal immunity was reduced by some other adversity. The same suspicion of the monkey had been held by other observers, and Manson had suggested that a reservoir of the infection existed in some lower animal as in the case of plague and sleeping sickness. The United States has no wild monkeys and yellow fever is invariably an importation. It seems also that the fever is endemic only where monkeys abound. Of course careless or bad sanitation might keep the disease endemic where there are no monkeys, but no amount of sanitation will prevent sporadic cases due to accidental contact with mosquitoes infected by monkeys, if this new

hypothesis is correct. That is, the possibility of eradicating this disease from the earth is dependent upon eradicating either the carrier mosquito or the animals which harbor the germs permanently. There is no ground for despair, as greater wonders have been wrought. The sanitary conquest of the tropics has only just begun, and its possibilities for human betterment are inconceivably great. Here then is one more argument for the control of tropical countries by white men in self-protection. Governments by tropical natives have utterly failed to safeguard the life and property of resident or visiting aliens, and are now known to be inimical to the health of northern neighbors through the occasional emigration of endemic infections. We can not quarantine against them forever. Our manifest destiny is to remove the sources of trouble for our mutual welfare. Those "little Americans" who object to such control as would bring safe government are opposing the welfare of humanity.

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**The sunshine delusion for tuberculosis** has been refuted time and time again, yet it cannot now be eradicated from the lay mind. The last statement of this kind was made June 20, 1912 by Borough President Marcus M. Marks at a reception at the Farmingdale, N. J., Tuberculosis Preventorium for Children. He is so wedded to this idea that he would turn every roof in the city into a sun bath for children. As a matter of fact, the more sunshine there is in a European city the higher is the tuberculosis death rate. People do not seem able to realize the fact that if strong sunshine kills a disease germ it will also kill all other cells, our own included as we see in cases of sunburn. Sun-baths—real sun-baths to the naked body—are being given up all over the world except by Rollier in the Alps and even he dares not give them in midsummer nor to those who are not so thoroughly tanned that the light cannot penetrate. There is plenty of evidence that strong sunlight and particularly the ultra violet and X-rays can cure localized tuberculosis—not by any germicidal power but by an irritation which increases the flow of serum into the part as in Bier's treatment. To apply the sun to the healthy parts and thus draw the serum from the diseased is worse than useless. Similarly, tropical experience shows that strong sunshine predisposes one to active tuberculosis if he has not sufficient pigment in his skin. Mr. Marks confuses fresh cold air with sunshine, for the former is the curative factor out doors. The preventorium must keep children in the shade in midday during the light season or it will do more harm than good as has been proved in Berlin. A dark windowless living room may do harm, but that is no excuse for overdoing the matter. If the child is outdoors in the shade it gets ample light—if it needs any at all. A dark skinned city Hebrew child can stand an amount of light which would be fatal to the blond Irish and that is one of the reasons why the New York City Hebrews have only one-third the mortality of the Irish. That is, the blonder the child the more necessary to keep it in the shade at midday. Among German children exposed to sun baths in Berlin, various nervous conditions became so numerous that the habit was condemned years ago.



## MEN AND THINGS

**The President-elect of the American Medical Association** is Dr. Wm. L. Rodman, Professor of Surgery in the Medico-Chirurgical College of Philadelphia.

He has been prominent in the affairs of the Association since 1897 when he was made chairman of the Surgical Section. He later served as trustee and in the committees on legislation and reciprocity, so he is well versed in the practical affairs of the Association and can be counted on to advance its welfare.

He has already had much to do with advancing the standards of the preliminary education of students of medicine. His professional career has been a varied and brilliant one ever since he gained an internship in the Jefferson Medical College immediately after his graduation in 1879. Two years in the army in the west and two in general practice in Texas, fitted him to specialize in surgery. He was first connected with the University of Louisville but was made Professor of Surgery in the Kentucky School of Medicine in 1893, and in the Medico-Chirurgical College of Philadelphia five years later. He has contributed largely to medical literature. We are sure that the constructive record of the Association will be continued and intensified under the able leadership of its new president.



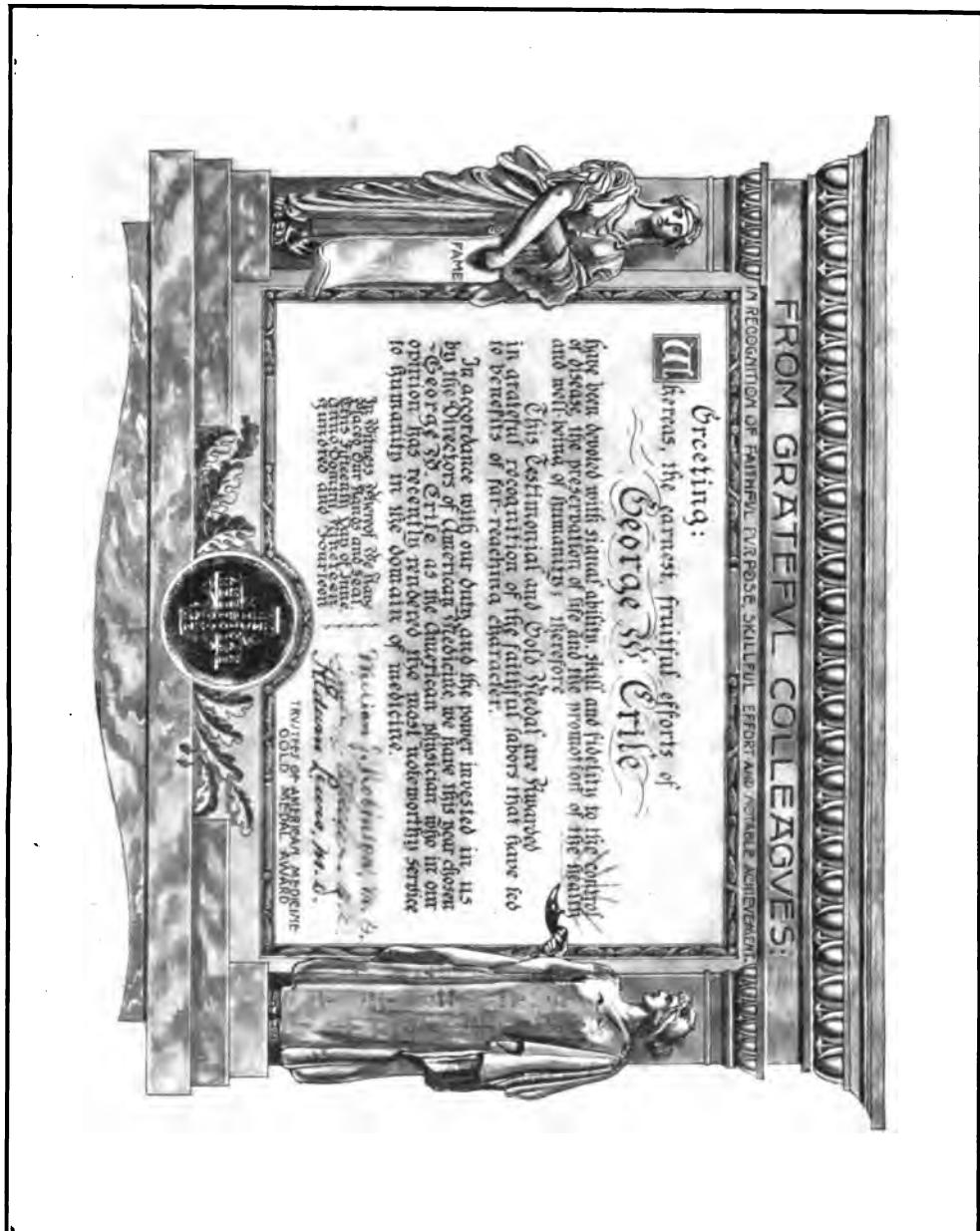
announcement made in our June issue—has been awarded to Dr. George W. Crile of Cleveland, Ohio, as the American physician who has made the most notable contribution to medicine or surgery during the past year.

As expected, this award has met with wide-spread approval and a large number of communications have been received expressing without exception complete satisfaction with the decision of the Trustees.

Dr. Crile's researches have made his name one of the best known wherever modern surgery is practiced and his contributions to surgical literature have been numerous and noteworthy. His work in connection with blood transfusion has attracted much attention and the method he has devised is growing in popularity as its advantages are recognized. Other problems of surgery have been taken up by Dr. Crile and worked out with the same scientific care and attention to technical detail that have characterized all of his undertakings.

It has been his studies of shock, however, that have brought Dr. Crile into the front rank of surgical investigators, and while his views have been revolutionary in many respects, they have been so well supported by experimental and clinical data, and have so satisfactorily withstood every scientific test, that there can be no question of their correctness. A particular feature of Dr. Crile's work has been its freedom from spectacularism. Unheralded and unsung, he has steadily pursued his investigations, and although he must have realized the great importance of the reports he has modestly made whenever he has reached a conclusion or achieved a result he has felt he should give to his colleagues, his communications have been entirely free from the self consciousness or pride of accomplishment that all too often mars the announcements of research workers.

**The American Medicine Gold Medal for 1914**—as stated in the preliminary



Lack of space precludes any extended description of Dr. Crile's brilliant discoveries. Briefly, he has claimed that experimental investigations indicate that the essential lesion of shock is in the brain cells in which potential energy is changed into kinetic energy—probably at the expense of certain chemical compounds stored in the cells. This stored energy, as Dr. Crile has very definitely shown, is discharged in response to a stimulus—some trauma or emotion—and that whether the person be conscious or unconscious. To prevent the effect of surgical trauma on the brain cells local anesthesia is employed to intercept or short circuit the stimuli. This is combined with general anesthesia, and the combination of the two constitutes anoci-association.

The operative results that have been obtained by practical use of the anoci-association method, not only by Dr. Crile himself, but by many other surgeons working independently, have demonstrated the soundness of his conclusions, and as many have declared, mark the beginning of a new era in operative surgery. Shock can thus be eliminated from many surgical operations, with effects on the end results and general mortality rate that are very pronounced. Indeed the clinical and statistical evidence that Dr. Crile and other operators have presented leaves no doubt whatsoever of the practical value of the anoci-association method.

Great credit is due, therefore, to Dr. Crile for his splendid contributions to surgery. Without the slightest intention of being fulsome in our appreciation, we heartily agree with those who have not hesitated to express the conviction that his discoveries and their practical application will take rank with the discoveries of general anesthesia and antisepsis. Dr. Frank's paper in this issue gives a very clear and comprehensive view of anoci-association anesthesia and fairly states the estimation that scientific surgeons have placed on the method and its underlying principles.

The many American physicians who are interested in the activities of AMERICAN MEDICINE will be gratified at the continued success of the project inaugurated two years ago with the object of giving special

recognition each year to the American physician or surgeon who has made the most notable contribution in the domain of medicine or surgery during the preceding twelve months.

To the recipient this year, Dr. George W. Crile, we extend the felicitations of thousands of American medical men whose co-operation has made the AMERICAN MEDICINE Gold Medal Award possible, and who with the Trustees of the Award, and the Editorial Staff of AMERICAN MEDICINE join in expressing in this humble but none the less sincere way their hearty commendation of his labors and grateful appreciation of his achievements. May he long be spared to work for the alleviation of afflicted humanity and the glory of American surgery!

AMERICAN MEDICINE counts it a great privilege that it has been able to aid even so humbly in according recognition to such a notable group of American physicians as Wm. C. Gorgas, Milton J. Rosenau and George W. Crile.

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**Feminism and the Birth-Rate.**—We are not among those who view the advance of the feminist movement with any apprehension on the score of its effect on the birth-rate says the *Medical Times*. With Mr. Joseph Conrad, the eminent novelist, we believe that women will never be able to live up to the wild speculations which some of them "believe they believe." Femininity involves restraint as well as inspiration, and at the same time that it threatens trouble it "prevents them from coming on deck and playing hell with the ship." A low birth-rate is essentially an economic phenomenon. Under decent economic conditions maternity would flourish. Motherhood is necessarily included in the fulfillment of destiny which woman is clamoring for, and under proper conditions would aid and not hamper the development of individuality and the growth of mind and soul. Then it would be the richest of endowments, to be sought eagerly. Then the handicapped woman would be she to whom it might chance to be denied.



## WHEN TO OPERATE IN CHRONIC CONDITIONS OF THE STOMACH.

BY

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and

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The chronic cases which suggest a possible need of stomach surgery may be conveniently divided into those with signs of obstruction at cardia, pylorus, or in the body of the stomach, and those without signs of obstruction.

In their estimation it is not our intention to enter into a critical review of all the possible methods in diagnosis or to make a report of unusual cases, but rather to bring forward and place a value upon certain easily made clinical tests which will help the general practitioner to decide when there is or is not a need for surgical intervention.

**I. Obstructing Lesions.**—1. If there is a *dysphagia*, and the obstruction is at or near the cardia, as shown by the stomach tube or esophageal bougie, there is a condition of cardio-spasm with esophageal dilatation, of diverticulum, of connective tissue stricture, or of cancer either of the esophagus or of the lesser curvature of the stomach involving the cardia. As such cases, however, are in

most instances not surgical, and as they are rare in the practice of anyone but the specialist, we would merely call attention to the great value of the Roentgen-ray examination in their differential diagnosis.

2. *Ulcer*—In stomach cases a very common history is that of attacks of indigestion, recurring at intervals for years, each attack lasting from one week to three months. The attacks manifest themselves by a peculiar gnawing or empty or gone sensation in the stomach, with a general feeling of lassitude and sometimes nausea, occurring some three or four hours after meals, night or day, and relieved by sodium bicarbonate or a glass of milk, or even a glass of soda water, and usually made worse by buttermilk. As a rule these patients have been extensive users of sodium bicarbonate, rhubarb and soda, soda mints, etc.

These cases are frequently treated for nervous dyspepsia, and their history may date back a great many years. But such a history points to an ulcer, the site of which is generally the first portion of the duodenum, though it may be prepyloric. If there is no obstruction to the emptying of the stomach, such an ulcer does not ordinarily call for surgical treatment.

But if, with or without the above history of recurrences, and the so-called "empty pain" and its relief by alkalies or food, there is a story of much flatulence, if there has been repeated vomiting of sour food, if there is an obvious state of poor nutrition,

<sup>1</sup> Read at the Annual Meeting of the Medical Society of the State of New York, Apr. 30, 1914.

or if there has been frequent resort to lavage for relief from stomach distress, the history points to obstruction in the neighborhood of the pylorus. The "empty pain" or craving for food does not of necessity mean an empty stomach; in cases of pyloric obstruction, it is frequently present when there is sour fermenting food in the stomach.

With the symptoms of stagnation outlined above, the tests of most value are the test dinner and artificial dilatation. A simple test dinner that we frequently employ consists of one lamb chop, one baked potato, one helping of corn or peas, one slice of bread and butter, and a dish of stewed prunes. For the dilatation of the stomach we regularly employ half a teaspoonful of tartaric acid and a teaspoonful of sodium bicarbonate, each dissolved in half a glass of water. The tartaric is given first and is followed by half the bicarbonate solution. If there is not a good distention of the stomach the rest of the bicarbonate is given. The stomach tube and an air bulb may be employed, but we do not find this so good a method for the dilatation.

If on dilatation a good pyloric gurgle recurs at more or less regular intervals, as heard with the stethoscope, and if at the end of six hours the test dinner shows no residue, the case is positively not one of surgical obstruction.

If on dilatation there are good peristaltic waves, but absence of pyloric gurgle or only a slight irregular gas sound in the pyloric region, the pylorus is either obstructed or spasmodically closed. If peristalsis is not evident, the absence of pyloric gurgle has little or no value as a diagnostic sign.

If, eight hours after such a simple test dinner as that spoken of, the stomach contains a considerable quantity of the dinner

in a fermenting condition, and the same result is obtained after the treatment for one to three weeks with bland, well disintegrated food, correction of hyperacidity, and rest, the pyloric region is obstructed, and the case is positively surgical. It is not always necessary to put the patient under treatment and to wait so long before making the diagnosis.

A test often employed for obstruction is a rice and raisin meal at 10 p. m., the finding of remnants of this meal at 8 a. m., indicating obstruction. For this over-night test we prefer stewed prunes, for in several cases of obstruction, proven by operation, we have had negative findings after the rice and raisins, and positive after the prunes. This is due apparently to the less thorough mastication of prunes.

A good breakfast test is stewed prunes, oatmeal and cream, and a hard-boiled egg with toast. Their presence ten hours later makes a positive test. These tests should be repeated one and two weeks later for corroboration, the patient in the meantime being kept on thoroughly disintegrated and bland food.

The diagnosis may be corroborated by Roentgen-ray findings, the pyloric region or first portion of the duodenum showing distortion, or the first portion of duodenum failing to fill out properly and the stomach retaining a portion of the bismuth meal at the end of six hours. As a rule the Roentgen-rays are not necessary for this diagnosis, but before any operation for obstruction it is wise to use the Roentgen ray as a check, as in some cases it not merely corroborates, but actually supplements the clinical diagnosis. In other words the Roentgen-ray examination may show something unsuspected from the clinical tests.

3. In cases of pure *pylorospasm* with-



Fig. 1. HAIR-BALL REMOVED FROM THE STOMACH. Note the perfect mold of the stomach and the prolongation into the duodenum. The hairs are all long ones and perfectly preserved, and show no effect from the gastric juice, although they have been in the stomach for years. Roentgen diagnosis made by Dr. L. T. Le Wald. Case was successfully operated upon by Dr. Walton Martin at St. Luke's Hospital.



Fig. 2. TRIFID STOMACH. Extreme degree of deformity due to ulcer. Female aged 44. Clinical diagnosis was carcinoma; but Roentgen examination showed no evidence of malignant growth. Roentgen diagnosis confirmed at operation by Dr. Chas. L. Gibson.



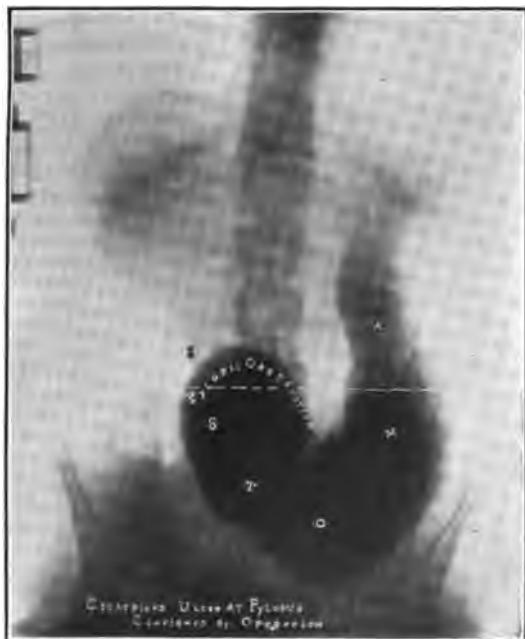
Fig. 3. SYPHILIS OF THE STOMACH. Female aged 16 years. Chief symptoms vomiting and extreme emaciation. Roentgen examination revealed this marked deformity of the body of the stomach with stenosis of such a degree as to demand gastro-enterostomy, which was performed by Dr. W. Downes. Note the compensatory dilatation of the esophagus. Wassermann positive.



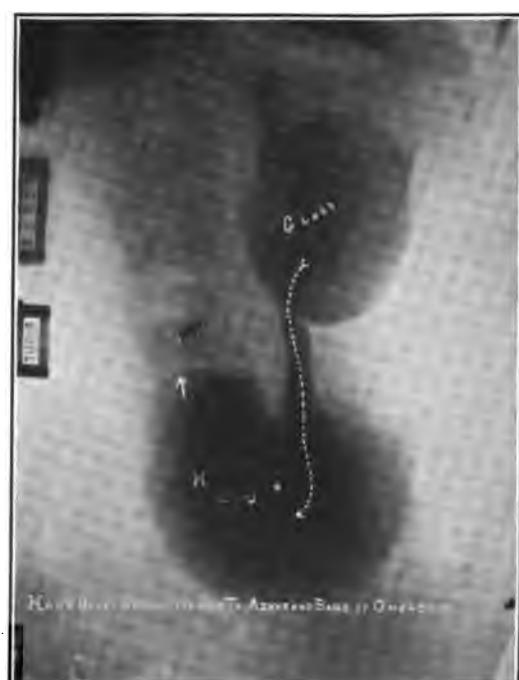
**Fig. 4. ULCER OF THE LESSER CURVATURE.** Female aged 28 years. Vomiting and severe pain. Total acidity 12; HCl none. Note the deep incisura.



**Fig. 5. AFTER EXCISION OF THE ULCER.** Ideal operation—complete resection of the median portion of the stomach by Dr. W. A. Downes, as indicated by the dotted lines in fig. 4. The ulcer had penetrated to the pancreas.



**Fig. 6. CICATRIZED ULCER AT THE PYLORUS.** Female aged 35. Marked stenosis so that traces of the opaque meal remained in the stomach for 48 hours. Roentgen diagnosis confirmed at operation by Dr. J. M. Draper.



**Fig. 7. HOUR-GLASS STOMACH.** Female aged 43. Operation by Dr. Walton Martin showed the presence of a band of omentum adherent to the liver, near the site of a former operation.



**Fig. 8.** NORMAL STOMACH OF AN INFANT. Exposure made a few minutes after the introduction of an opaque meal through a stomach tube. Note how some of the food has already passed into the jejunum.



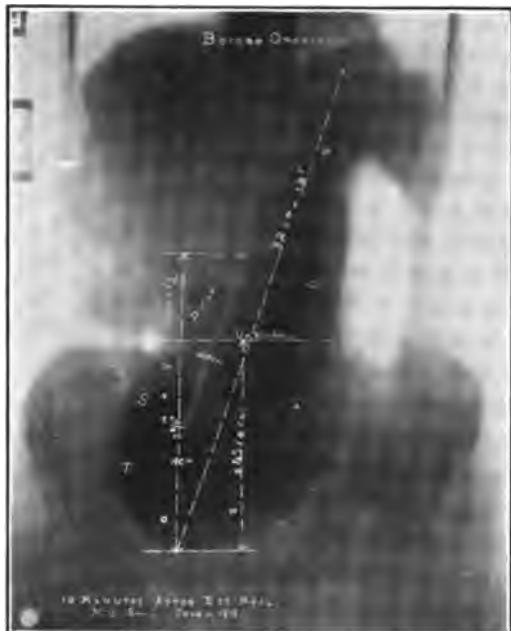
**Fig. 9.** PYLORIC OBSTRUCTION IN AN INFANT. Exposure made one hour after the introduction of an opaque meal. Only a trace of food has entered the jejunum.



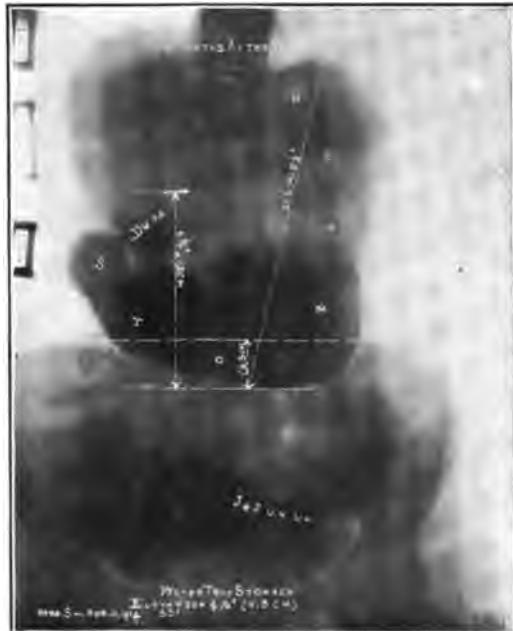
**Fig. 10.** WATER-TRAP STOMACH. Greater curvature 15 cm. below umbilicus. Pyloric arm (vert. meas. from highest point of duod. to lowest part of stomach) 18 cm. See fig. 11 for residue.



**Fig. 11.** RESIDUE IN A WATER-TRAP STOMACH. Exposure made 10 hours after the opaque meal, no food or drink having been taken after the opaque meal. Operation indicated.



**Fig. 12. WATER-TRAP STOMACH, BEFORE OPERATION.** Female aged 45. "Stomach trouble" for 18 years. Had given up all hope of being cured. Roentgen examination negative for ulcer, but showed definite water-trap stomach with large 6 hr. residue.



**Fig. 13. AFTER OPERATION, SUSPENSION METHOD.** Same case as in fig. 12, nearly a year after operation by Dr. J. M. Draper. Stomach remains elevated and empties itself. Patient feels well and has gained 28 pounds.



**Fig. 14. WATER-TRAP STOMACH, BEFORE OPERATION.** Female aged 24. Repeated vomiting attacks. Clinical diagnosis pyloric obstruction. Roentgen examination revealed typical water-trap stomach with a large 6 hour residue.



**Fig. 15. AFTER OPERATION, GASTRO-ENTEROSTOMY WITH CLOSURE OF THE PYLORUS.** Same case as in fig. 14. Medical treatment for 8 months having been given without relief, gastro-enterostomy was performed by Dr. W. A. Downes. Complete restoration of



Fig. 16. RESIDUE IN STOMACH DUE TO GALL-STONE COMPRESSING DUODENUM. Male aged 43. "Stomach trouble" for 14 years. The calculus can just be seen as a faint oval outline. Removal by John Douglas resulted in cure.



Fig. 17. HAIR-BALL IN THE STOMACH. Female aged 24. History of nausea and indigestion. A mass could be felt low down in abdomen. Clinical diagnosis: probable tuberculous peritonitis with rolled up omentum. Positive diagnosis of hair-ball made by Roentgen examination and confirmed by operation.

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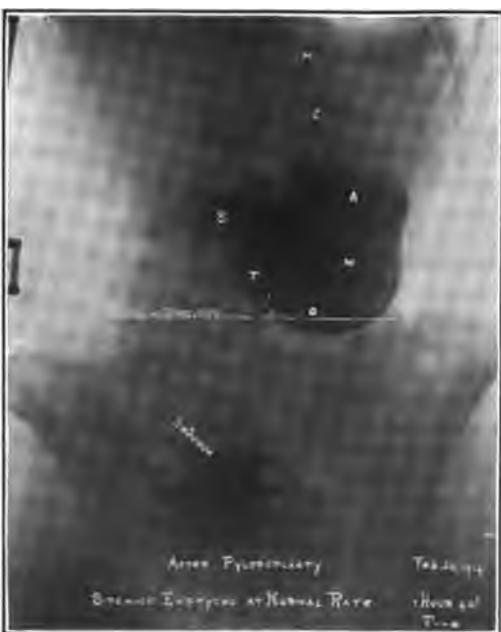
**Fig. 18. EARLY CASE OF CARCINOMA OF STOMACH.** Male aged 60. Stomach trouble for 3 years. Recent loss of 20 lbs. Operation by Dr. Frank Mathews. Pyloric end of stomach completely resected and posterior gastro-enterostomy performed.



**Fig. 19. AFTER PARTIAL GASTRECTOMY FOR CARCINOMA.** Same case as in fig. 18. Microscopic examination showed this to be a case of carcinoma following ulcer. No recurrence to date—one year.



**Fig. 20. PYLOROSPASM.** Female aged 32. Persistent vomiting attacks. Remarkable Roentgen findings. Only enough food left the stomach in 4 hours to outline the duodenal cap



**Fig. 21. AFTER PYLOROPLASTY FOR PYLOROSPASM.**  
Same case as in fig. 20. Roentgen diagnosis confirmed at operation by Dr. W. A. Downes. No ulcer. Pylorus incised and sutured in transverse direction. Perfect recovery.

out organic lesion at the pylorus, there may be some uncertainty in the diagnosis; but in these cases we note the absence of relief on taking food or alkalies, the non-relation of the pain to the period of digestion (2 to 4 hours after eating), and the lack of marked tenderness to finger-point pressure in the duodenal or pyloric region. Moreover, we are prone to have a history of equal distress from small meals or large, and at times no distress at all when a particularly large and varied meal is eaten in pleasant company.

In some cases of persistent pylorospasm in which the cause of the spasm cannot be removed, gastro-enterostomy may be indicated. This was the case, for example, in one of our patients with hour-glass stomach. At operation there was a large ulcer of the lesser curvature, and the pylorus, under the ether relaxation, admitted two fingers. But the ulcer could not be removed, and after the operation the pyloric spasm was as troublesome as before.

4. *Pyloric Obstruction in Infants.*—That liquid foods normally begin to be expelled in a very short time after they are taken into the stomach is a fact that is very helpful in our diagnosis of conditions dealing with some form of pyloric obstruction. For, we can demonstrate with a degree of exactness, by a series of radiographs, that the milk as shown by the bismuth shadow, is retained for a greater length of time than in a normal stomach, and we can determine with a fair degree of certainty with what type of obstruction we are dealing. If such striking results can be obtained by this means, it would seem to us manifestly unfair not to obtain an early series of radiograms in every suspected case, so that the infant, suffering from a true tumor with a lumen so small as practically to occlude

the passage of the food into the duodenum, may be transferred to the surgeon while its physical condition is still good. On the other hand, cases of pyloric spasm, even of marked degree, but without tumor formation, can be differentiated, since the time and the amount of food passing through the pylorus can be seen, and thus the diagnosis, and even the prognosis, can be fairly well fixed.

5. The presence of a pyloric obstruction having been determined, the next question to decide is *the nature of the lesion*. Is it ulcer, cancer, adhesions, etc.? So far as its surgical status is concerned, that is the same no matter what the lesion, for "food retention calls for surgery." Between early cancer, ulcer and adhesions it may be impossible to make a clinical diagnosis, and then the Roentgen ray may be determinative.

If the stools of an obstruction case do not persistently show occult blood, and if repeated test breakfasts given after thorough lavage show a high hydrochloric acidity, one is justified in the diagnosis of ulcer, though one cannot as a rule say absolutely that the ulcer is not beginning to undergo cancerous change. If a tender mass is felt in the pyloric region, if the stools persistently show occult blood, if after lavage the test breakfast gives absence of free hydrochloric acid, one is justified in the tentative diagnosis of cancer, whether there is cachexia or not.

The reason for lavage as a preliminary to the test breakfasts in these cases is that when there are fermenting retained contents in a cancer case there is not infrequently free hydrochloric acid, Boas' "hydrochloric acid of retention," while after lavage the test breakfast shows the diagnostic absence of free hydrochloric acid. Also in the stagnation contents of an ulcer.

case there may be milk sourness from milk taken the day before, and consequently the presence of lactic acid with its suggestion of cancer.

We could cite a number of cases from our experience, where, in the belief that he was dealing with a cancer, the surgeon removed a portion of the stomach, but in which the most careful search of the removed mass failed to show any cancerous tissue. We have also had cases which gave manifest signs of cancer within two or three months of an operation at which the surgeon was convinced that he was dealing with a simple indurated ulcer and therefore did not remove it.

We might say that these cases were correctly diagnosed clinically before operation, and they have led us to believe in the possibility in most instances of making a correct clinical diagnosis at as early a time as a surgeon could be induced to operate.

6. *Hour-Glass Stomach*.—In a case seen recently, with a history of obstruction and vomiting of retained contents, it was noted that the stomach was continuously in a condition of very great peristaltic activity. That seemed to suggest pyloric stenosis, but on listening with the stethoscope there was regular and frequent loud pyloric gurgle, so that the pylorus was evidently opening and closing in a normal manner. On dilating with gas there was a rounded prominence projecting one and one-half inches beyond the left ribs, and reaching just to the point where the peristaltic waves began. It was obviously a two pouch or hour-glass stomach. A small test dinner showed a fair residue at the end of six hours, and the Roentgen rays showed the double pouch.

The classical sign of hour-glass stomach is the sudden appearance of food residue after the stomach has apparently been

washed clean. But we would caution against attributing much weight to this sign, for we have had it happen in cases which have been proven by operation to be free from hour-glass. In some of these cases it might be due to pseudo hour-glass constriction, i. e., spasmodic constriction in the body of the stomach without organic lesion, for this would not show in a patient under an anesthetic. But it has occurred in cases with atonic dilated stomach, and therefore is a misleading rather than a useful sign. An hour-glass stomach is a surgical stomach. The best clinical method for its diagnosis is dilatation with gas, but the value of this method is much exceeded by that of the Roentgen rays.

**II. Non-Obstructing Lesions.—1. Ulcer**  
—We are of the opinion that a non-obstructing ulcer of either duodenum or stomach is not ordinarily a surgical condition. But if the Roentgen ray shows it to be a perforating ulcer, or if, in spite of proper ulcer treatment, it is the site of repeated severe hemorrhage or of persistent hemorrhage, is a constant source of pain or nausea, or interferes persistently with nutrition, it is surgical. Indeed if for any reason whatever it persistently keeps a person from proper attention to business it requires surgery.

2. *Cancer* is always surgical whether obstructive or non-obstructive, unless it has reached the stage of being inoperable. On the one hand we have the cases with palpable tumor, with absence of free hydrochloric acid and the presence of lactic acid in the test-breakfast findings, with constant blood in the stool, and with or without coffee ground material in the stomach. These signs point to cancer, but not to cancer in the early stage; yet it should be considered as in the operable stage. On the other hand, if the tumor is large and immovable, or is

accompanied by metastases or very marked cachexia with enfeeblement, it is in the class of the inoperable.

We have no satisfactory method of making a diagnosis of cancer, if it is non-obstructing, non-palpable, non-ulcerating and non-hemorrhagic. The laboratory men are developing tests that may help us; but in these early cases we have no reason for suspecting cancer, and so will be unlikely to have recourse to laboratory tests unless they are so developed as to be easily made in the physician's office.

3. *Gastropoiesis, etc.*—The question as to whether an operation should be done on the stomach, in cases of pronounced gastropoiesis, and in those cases of simple water-trap stomach described by Satterlee and LeWald, is an open one.

We might quote Satterlee and LeWald in this matter:

*Water-trap Stomach.*—“We believe the water-trap stomach to be a morphologic entity, a deformed organ which gives rise to a certain definite train of symptoms.

“The chief characteristic of this stomach is the relatively high, but normally placed, pyloric outlet, which is well held up to the spine by the gastrohepatic ligament and the retroperitoneal tissue. The water-trap stomach might almost be considered as a ptosed organ, with the first portion of the duodenum and pylorus fixed in proper position, giving the characteristic long pyloric arm and resemblance to a water-trap. Vomiting is infrequent and is rarely a marked symptom. Residue in the stomach is much more frequent, and part of the symptoms can often be traced to this condition.

“The indications for and against operation may be summarized as follows:

“a. Care should be taken not to operate on a simple, ptosed stomach, with or

without dilatation. This rule is subject to occasional modifications.

“b. The typical water-trap stomach of mild degree which does not yield to medical treatment should be operated on.

“c. The typical water-trap stomach of marked degree, which shows a large residue in the stomach after six hours, should be operated on as soon as diagnosed.”

4. *Foreign Bodies in the Stomach.*—When such are suspected careful Roentgen-ray examinations should be made. The accompanying illustration of a hair-ball in the stomach well illustrates this point.

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## ANESTHESIA BY THE ANOCl-ASSOCIATION METHOD AS A MEANS OF LOWERING OPERATIVE MORTALITY.

BY

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It must not be inferred from the subscription hereof that the writer believes operative mortality can be lowered by the employment of the “ano-cl-association” method of anesthesia (Crile) alone; but he wishes to insist that appreciation of all the factors in summarizing the risks of surgical operations upon human beings cannot be considered complete without a thorough understanding of the principles of this method of anesthesia, and the hypotheses and proofs thereof upon which the procedure is based. Perfect asepsis, control of hemorrhage, the condition of the patient as an operable risk, must all be placed in the balance, and surgical judgment (a quality difficult to define) must not be lacking.

The time factor, i. e., the time actually consumed in executing the operative work

undertaken, is hardly to be considered if one makes use of the proper method of anesthesia. Even under the ordinary mode of inducing anesthesia, the time consumed in the operative work is not of the greatest importance. The surgeon has hitherto feared extensive (i. e., time-consuming) operations because of the shock thereby induced. It is not, nor has it ever been, a question of time, but one of shock.

What is shock? What produces shock? How can shock be avoided? It has been conclusively shown that in the condition recognized as shock there is an exhaustion of certain cells in the central nervous system. It was formerly believed shock and hemorrhage were synonymous; but the fact is they are not synonymous excepting in their effect upon the brain cells. Physical exhaustion and overpowering emotions may produce similar effects. In hemorrhage the brain is the first organ to succumb; the central nervous system dies more quickly than any other structure as a result of acute anemia; and its regenerative ability from acute anemia is less than that of any other organ.

The changes in the nerve cells of those suffering from acute anemia follow the loss of blood; the changes in those suffering from shock precede all other manifestations. In the first instance, it is the result of nutritional loss; in the second, of energy loss.

Shock, then, is really a loss of vital force due to brain-cell stimulation through either the sensory or the psychic system. All the emotions are probably traceable to and have their origin in the tactile sensory system.

From a surgical standpoint trauma, i. e., pain (though fear should also be mentioned) is the stimulus which produces discharge of energy from the central nervous system in

sufficient quantity to induce shock. If transmission through the central nervous system of impulses produced by the operation can be avoided, everything else being equal, shock may be prevented or markedly minimized.

Physical exhaustion is accompanied by changes in the central nervous system similar to those observed in shock, likewise emotions and feelings excited by the reception of noxious impressions through the sense of hearing or sight may produce changes which cannot be differentiated from those found in shock. It is obvious, then, that the special senses must be held in abeyance, that the patient may receive no harmful suggestions either through the sense of hearing, seeing, smelling, tasting or feeling, if we are to obviate energy loss and changes in the brain cells.

Can this be done? If so, then shock may be avoided, provided that anesthetic be used which causes no change in the tissues, and if we avoid cerebral anemia, which may be translated into saying that we feed a sufficient amount of oxygen to the brain cells.

Under ether anesthesia alone, also under chloroform anesthesia, it has always been noted that the gentler one handled the structures during an operation the better the patient would do; in other words, the less the insult to the tissues, i. e., minimizing trauma, the less shock the patient showed, the quicker and smoother was the recovery.

What is the explanation? The answer may be found in the fact that while the patient was physically completely anesthetized, the brain was only partially so. Just as soon as this important point was discovered, Crile endeavored to overcome the defects in our anesthetic methods as applied to surgery. He has accomplished this by not only abolishing reflexes and conscious feel-

ing, but by the addition of local anesthesia in and around the field of operation has effectually prevented the transmission of any stimulation from the operative area to the brain, thereby arresting subconscious feeling. This, in brief, is the principle of the "anoci-association" method of anesthesia, and "these principles depend upon the abolition of all noxious perceptions through the special and psychic senses." We must, in other words, prevent perceptions through the special senses, and emotions which may be excited by stimulation of any of these senses. All communication between the operative field and the surroundings and the brain of the patient must be prevented, i. e., the perception of the preparations for the operation, the sight of the surgeon, of the instruments, of the operating room, hearing the talk and the click of the instruments, must be banished from the patient and he be kept in an absolutely normal and quiescent state without fear or excitation, if every vestige of shock is to be obviated.

Under local anesthesia the harmful influences come through mental association of the sights and noises and the surroundings in the operating room. Under general anesthesia we abolish all this, but we cannot abolish the stimulation produced by the excitation of trauma; we merely place the patient in a condition that, although the brain receives every stimulus, is aware of every shock, it cannot escape because the conscious brain has been put to sleep. However, the subconscious brain is all the time attempting to escape, as shown by the changes in respiration and the pulse under light anesthesia—the anesthesia being sufficient, however, to prevent any knowledge or recollection upon the patient's part that pain was inflicted, or that an operation was performed.

Under the "anoci-association" principles it is necessary to use as the anesthetic that agent which not only is the least dangerous, but which produces the least change in the nerve cells and upon the heart as shown by the blood pressure. The ideal general anesthetic is not ether, nor chloroform nor a combination of these, but a proper admixture of nitrous oxide gas and oxygen.

Permit me to interpolate here that nitrous oxide gas, in the hands of those unskilled in its administration, is an exceedingly dangerous agent. While ether may be given with safety by the ordinarily careful anesthetist, to administer nitrous oxide without danger requires a skilled anesthetist accustomed to its use and one constantly on the alert. One cannot safely give nitrous oxide gas and watch the operation, as not infrequently happens with those who administer ether as the anesthetic.

Briefly the "anoci-association" method of anesthesia may be described as follows: From half an hour to fifteen minutes before the operation the patient is given an hypodermic injection of morphine and atropine, morphine or scopolamine, or morphine plain, dependent upon the judgment of the anesthetist. The patient is taken directly into the operating room where gas-oxygen is administered as the anesthetic. The field being prepared, the line of proposed incision is injected with a one-quarter per cent novocaine solution. After incising the skin and fat the fascia and muscles are likewise injected. The incision is then continued until the depth of the operative field has been reached. In abdominal surgery the peritoneum after being opened is reflected and injected beyond the line of incision with novocaine followed by quinine-urea-hydrochloride in one-half per cent solution. The mesenteries are also injected with novocaine

solution before their division. This is true of the intestines, the gall-bladder, the appendix, the uterus and the appendages. In renal surgery the injection is extended well around the kidney, although as a rule this organ (like other intra-abdominal organs) is not very susceptible to contact impressions. After the tissues have been divided all suture lines and areas in the track of ligatures and proximal thereto are injected with the quinine-urea solution. Before the incision is closed the muscles, fascia and skin are also injected with quinine-urea behind the proposed suture line. The novocaine solution must be well distributed by pressure before incising the tissues, and the quinine-urea solution should be injected well behind the operative field.

Permit me to recommend the employment of this method to you. My recommendation is based upon an extensive experience in all types of surgery, in all classes of patients, of all ages, extending over a period of almost two years. I know that my mortality has been materially reduced. The use of morphine after the operation is the exception, all post-operative pain has been abolished. The patients look comfortable and never have the fearful expression so common to those operated upon under the ordinary anesthetic methods.

"Anoci-association" is a life saver, as by this method the surgeon is enabled to operate upon patients who, under any other form of anesthesia, would be impossible risks.

One need only walk through the wards of any hospital in which some members of the staff are using the "anoci-association" method and talk with the patients or the nurses in charge of them to determine which method he would prefer should he become the surgical subject.

The writer is sure that a fair trial of this

method properly executed will convince the most skeptical that it is one of the most beneficent surgical discoveries of the age, ranking, as Moynihan has said, with Listerism and the discovery of ether anesthesia.

400 Atherton Bldg.

## FARADIZATION IN THE TREATMENT OF POST-OPERATIVE ILEUS.

BY

EVAN O'NEIL KANE, M. D.,  
Kane, Pa.

No means for combating post-operative ileus has proved as satisfactory in my hands as faradization. Its method of employment is simple and inexpensive, as well as harmless; the nurse can be instructed in its application without any technical training or knowledge of electro-therapeutics.

To apply the current it is not necessary to change the sufferer's position in bed. All that is required is to remove the band and sufficient of the dressings to afford access to such portions of the abdomen as are not implicated in the operative incision. An ordinary "family" faradic battery is placed on a chair conveniently near the bed. One electrode, preferably the metal plate, covered with moist gauze is pushed under the small of the back being pressed snugly against it by a pad of folded towel. The other (the sponge) electrode is held by the operator, who, after turning on the current, mildly, at first, and increasing the force gradually, passes the sponge up and down and across the abdominal surface. It should be moved slowly and firmly without being lifted from the skin any oftener than can be avoided, as breaking the circuit occasions discomfort. With the excep-

tion of the actual wound area the entire belly should be thus treated, such points as may appear most distended or suggest special regions of obstruction being given more attention than others.

From ten to fifteen minutes are usually necessary at one seance, gas beginning to be freely expelled by the end of that time or within the next half hour. In obstinate cases or when the gas reaccumulates rapidly the procedure may be repeated as often as desired. In some instances it has proved efficacious to use the battery almost continuously, no ill effects or marked inconvenience to the patient appearing to be occasioned.

The strength of the current should be gauged by the tolerance of the individual and the amount of contraction of the abdominal muscles produced; this latter should not be to a degree sufficient to threaten the integrity of the line of suture.

It is immaterial upon which region the positive or negative pole is placed. Either seems equally satisfactory.

I have employed faradization as above described for many years indiscriminately in all cases of gaseous distension after celiotomy and have frequently seen it successful in subjects intractable to other stimulus. I believe I may claim to have the right of priority in thus employing electricity as a peristaltic tonic. Certainly no one else has availed himself of it as a routine procedure.

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#### MEDICAL HINTS.

Do not let your patients with facial eczema wash with just any kind of soap and water. Good soft, or filtered rain-water, in which a little fine oatmeal has been thrown, will provide all that is necessary for ablution in such a case.—*Am. Jour. of Dermatology.*

## DEATH FROM STING OF RATTLE-SNAKE.

BY

HOWARD CRUTCHER, M. D.,

Roswell, New Mexico.

About four o'clock in the afternoon, D. J., a bright, energetic boy, aged seven, residing near Kenna, New Mexico, was struck by an enormous rattlesnake (*Crotalus adamanteus*, most probably), both fangs entering the ulnar side of the right forearm about three inches above the wrist. The injured extremity was corded at once and the parts incised. The Hon. Arthur J. Evans, M. D., of Elida, was summoned, arriving at the bedside of the patient five and a half hours after the receipt of the injury. Dr. Evans found the patient delirious, pulse 108, temperature nearly normal, with persistent vomiting. The corded arm was greatly swollen, with many vesicles present. The parents of the boy had given him about half a pint of whiskey during the first hour after the accident. Dr. Evans administered strychnia grs. 1-30 hypodermically every four hours, and applied a strong solution of potassium permanganate to the wound. Some improvements followed these measures, but the patient sank gradually and died at 10:20 a. m. following the injury.

It was most unfortunate that skilled assistance could not be obtained until after a delay of several hours, and the administration of such a quantity of alcohol by the parents was doubtless greatly against a favorable outcome.

In cases of this sort I believe that the prompt administration of a full dose of morphin would prove of great value in mitigating the effects of mental shock, which must certainly be a decisive factor in

many instances. I have now under my care a girl of 15 who was stung ten years ago by a copperhead (*Agkistrodon contortrix*). Both fang marks are perfectly distinct. The local symptoms at that time were trivial, but I am told by the girl's mother that grave symptoms of shock nearly proved fatal and that life was saved only by the most energetic efforts on the part of skilled physicians.

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## NOTES ON A NEW ORGANIC ARSENIC PREPARATION.

BY

EMILE BRUNOR, M. D.,  
New York City.

While looking for a new arsenic preparation which would take the place of salvarsan, I came across a report in the *Bulletins de la Societe Medicale des Hopitaux de Paris* (Jan. 18th, 1913), by Drs. De Beurmann, Mouneyrat and Tanon in which they describe a substance chemically known as a tetraoxydiphosphaminodiarsenobenzene which they have renamed galyl in honor of Galen who seems to have been the first to note the properties of arsenic.

The principal source of danger in using any organic arsenical preparation lies in its congestive power and neurotropic power or in simpler language the danger of causing a congestion intense enough to cause small hemorrhagic foci in the brain, liver, kidneys, lungs, etc., and the power of destroying nerve tissue. It has been found that nerve tissue has the power to fix arsenic and that the quantity fixed and retained varies with the individual. The neurotropic power of salvarsan explains the later manifestations which are ascribed to a relapse of nerve

syphilis or para-syphilis but which are really due to delayed neurotropism. There is no relation between the arsenical content of a chemical compound and its toxicity, because I have often injected 1 gm. of sodium cacodylate which contains 46% of arsenic without the symptoms of salvarsan which contains 35% arsenic. We believe that the toxicity of "606" is due not so much to the presence of arsenic in its molecule but rather to the way it is combined which makes it dilate the capillaries and attach this substance in an appreciable quantity upon the neurones. "606" behaves in reference to cellular nuclei in the same manner that basing coloring materials do, such as fuchsin, methylene blue, vesuvine, basique. The character is due to the same grouping as found in "606."

The following diagrams will show the graphic formula of salvarsan and galyl so that a comparison of the groupings may be had. I might remark here that the phosphamin group has been found in the lipoids derived from the ductless glands nerve tissue and blood cells as evidenced by the work of Henri Iscovesco.

Next to salvarsan (606) and neosalvarsan (914), we have to-day a new arsenical preparation which is an improvement or elaboration of the above mentioned arsenicals.

Galyl is due to the researches of Mouneyrat. Up to date this product has not been investigated thoroughly and in the use of this preparation I have had to use my own judgment as to the dosage necessary for each case; still basing my course on the work of Mouneyrat, DeBeurmann and Tanon. I have gotten along nicely and though my own experience is rather restricted, I have a series of ten cases upon which I have tried it, using the Wasserman

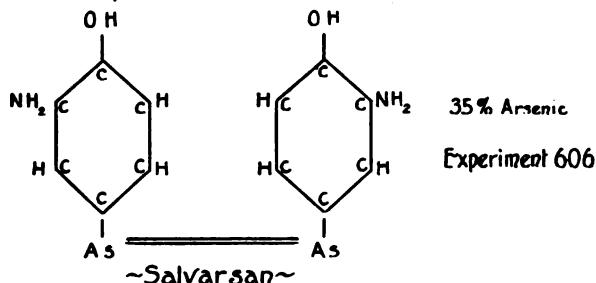
reaction before and after administering the remedy.

In regards to the medical composition and pharmacology of this new remedy, I would refer to the *Paris Clinique and Therapeu-*

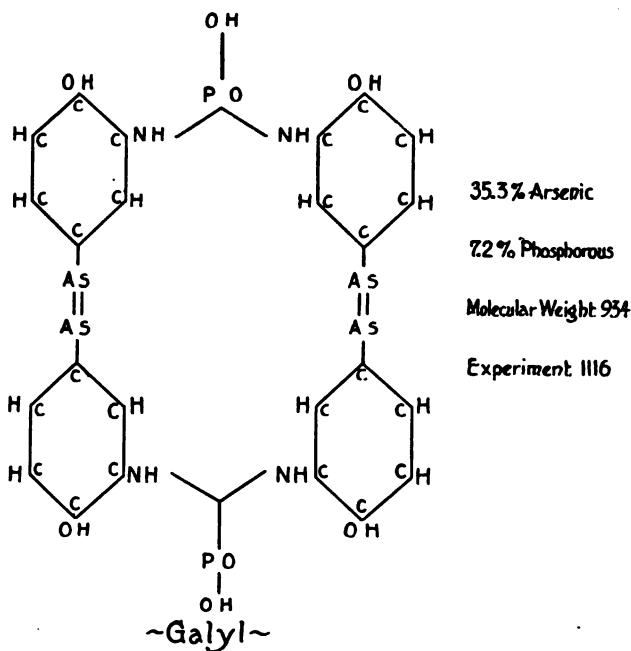
The average dose of ganyl for females is gm. 0.40 and for males gm. 0.50. However, I have made it a rule to begin the treatment with .40 and the following week increase to .45, the third week going up to .50 and any

Diagrams showing comparison between Salvarsan and Ganyl

"2 A"



35% Arsenic  
Experiment 606



35.3% Arsenic  
7.2% Phosphorous  
Molecular Weight 934

Experiment 1116

FIG. 1.

*tique*, No. 17, February 5th, 1913. I will simply relate certain observations and conclusions which my personal experience will allow me to formulate in reference to this new remedy.

further medication at the rate of 50 centigrams a week.

Ganyl is a tetraoxydiphosphaminodiarsenobenzene and contains 35.3% of arsenic. Salvarsan (606) is a dioxydiaminoarsenon-

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zol and it contains 35% arsenic so that the two preparations are almost identical in their arsenical content. Galyl and salvarsan are both yellowish green powders, odorless, not freely soluble in water or neutral solvents; freely soluble in alkaline water.

All the cases which I have selected for the use of this remedy have been only those who had typical clinical evidence of syphilis. The limited number of cases which I have to report is due to the fact that I have picked cases of syphilis from private practice and which I could verify by test. As usual, before the use of any arsenical medication, the patient is subjected to a rigid examination as to the condition of his heart, kidneys, liver, central nervous system and lungs so as to determine if there are contraindications against the use of this remedy.

The technique for the use of this remedy was not sent to me; therefore, I had to use my own judgment in administering it and I found that it is very difficult to dissolve gm. 0.40 in 10 c. c. of distilled water. Therefore I made a solution in 25 c. c. distilled water, making the water slightly alkaline with sodium carbonate and injected it with the Luer syringe and a 25 gauge needle, one and one-half inches long. The patient's arm is thoroughly scrubbed with gasoline and alcohol, then painted with a 2% iodine solution in alcohol, then the cuff of an Oliver blood pressure apparatus is placed on the arm and pumped until the veins become prominent. The patient is instructed to clench his fist and the needle is inserted in the largest vein at an angle of about 45 degrees. If the needle has penetrated into the lumen of the vessel, the blood will back up into syringe through needle, thus avoiding any painful sloughs. The air pressure is slowly released in the cuff and the solution is introduced by pressing on the plunger as

slowly as possible, taking about a minute to administer 25 c.c. If the patient is timorous, make him lie down on the operating table, place a towel over his eyes and allow the arm to hang over the side of the table; in patients with a high blood pressure it is always advisable to do so. The amount necessary to cure, i. e. to make the Wasserman test negative a fresh case of syphilis is approximately 1 gram of the drug for an adult weighing 150 pounds. The amount necessary to change reaction to the Wasserman test from positive to negative in an old case which has resisted treatment by (606) and mercury, is approximately 3 grams. The Herxheimer reaction has only been found in one case and that was a very nervous woman.

It has been found that two to three injections will make the primary lesions disappear and between three to six for secondary and tertiary.

It is useless to try to cure syphilis with galyl alone or any other arsenical for that matter. Mercury and potassium iodide must follow in every case. Mercury I prefer to administer by inunction of two grams of the blue ointment in the arm pits and the groin and popliteal space. Each day a separate side is taken for inunction. If the patient objects to the color and odor of the mercurial ointment, the calomelol ointment made by Heyden is just as efficient. I have used the tablets of proto-iodide of mercury gm. 01, three times a day or a suppository containing gm. 19 mercurial ointment with cocoa butter. One suppository at bed time. The mouth must be washed with a solution of potassium chlorate or glycerite of tannin in water. The iodine medication I use as intensively as the patient will stand. If the patient complains of severe secondary or tertiary symptoms, I use one gram t. i. d.

As much as 4 grams t. i. d. are given in plenty of water or milk. If there is any gastric intolerance, a mixture of one part potassium iodide and three parts essence of pepsin is given. Where the intolerance is still more pronounced, any of the organic iodine derivatives may be given. The syrup of hydriodic acid has been tried but in my hands found wanting, for it does not furnish

after massive doses of arsenicals is milder. After the injection of galyl the congestive symptoms have only been pronounced in two cases of ten and they are intense facial redness, hoarseness, intense lacrymation and coryza. The body temperature sometimes rises one or two degrees but the next day it is invariably normal. In two cases there was a transitory amblyopia, or partial blindness, lasting a few minutes.



FIG. 2.—Administration of Galyl in concentrated solutions.

iodine in massive doses such as this disease requires.

All cases, with perhaps one or two exceptions, complained of nausea. One-third suffered with vomiting, and one-tenth with vomiting and diarrhea—and this reaction occurred between one and three hours after the injection. The headache which is found

Dr. J. Johnson Abraham reports in the *British Medical Journal* (March 14th, 1914), ten cases which have been treated in the London Lock Hospital and the Kensington General Hospital for Women. The results are summarized as follows:

"Collecting all the evidence together we may say that any of these substances, salvarsan, neosalvarsan or galyl can be used

with apparent safety. Whether garyl possesses the extra advantages claimed for it, we have not as yet had enough experience to decide. That salvarsan has advantages over neosalvarsan would seem to be indicated by the Wasserman results. How garyl compares with either of them in this respect we do not as yet know. Finally, it would appear that mercury is regaining once more its old position as the main standby in the

The results are as rapid as with salvarsan and we have had no delayed sequela. It will be noted that although for reasons of caution we did not at first follow the maker's suggestion of a weekly injection for three weeks, the clinical results were nevertheless very good. Afterwards when we found that weekly injections appeared quite safe we used them with increasingly rapid results."



FIG. 3—Injection of Garyl in dilute solutions with double percolator.

treatment of syphilis; and that the real progress of arsено-therapy lies not in the direction of complete cure but rather in its rapid healing effects in the early, highly contagious stages of the disease, truly an almost estimable boon from the standpoint of the public health and the well being of the nation.

The following pictures illustrate the two methods of injecting garyl. The method in which the Luer syringe is used is according to Ravaut, Duhot, Emery, Strauss, and Stern, where the substance can be injected in a concentrated solution, and by thus

minimizing the quantity of liquid, the so-called water faults are also eliminated.

The second illustration is a double tube percolator. The outside tube contains normal saline solution; the inner tube contains the diluted garyl solution. By staining the saline solution with methylene blue, the progress of the injection can be watched easily.

*Case No. 17129.*—Greek laborer, age 22, 5 feet 9½ inches, 215 pounds. Suffering for three years with severe tertiary syphilis. Came to be treated in September and said that although he has received 2 intravenous injections of gm. 0.9 neosalvarsan, he suffers with headache, buzzing in ears, near-sight in one eye and hemianopsia in the other. Vision is greatly impaired, mental state is one of great discouragement. Wasserman test taken then shows + + + Three intravenous injections, one week apart of garyl.

Gm.	0.40
Gm.	0.45
Gm.	0.50

{in 25 c.c. distilled water

The first caused some fever and reaction. The second a little nausea, the third was very well tolerated. The headache and buzzing were relieved for a month but now the buzzing has recurred. Patient has been taking K. I. in large doses gm. 1 t. i. d. increasingly. Calomelol inunction in the intervals between injections.

Unfortunately patient could not be watched more rigidly and no doubt medicines and inunctions were not taken regularly, also food and personal hygiene were bad. Patient, like most Greeks, is an inveterate cigarette smoker.

On Nov. 29th, a second Wasserman test was secured which shows + + a diminution of 50%. This is very encouraging considering the fact that neosalvarsan was powerless to abate the disease. Garyl is twice as effective as neosalvarsan in half the dosage. It may be said to be four times as strong as neosalvarsan from clinical experience.

Dr. Archie L. Oberdorfer made an ophthalmological examination to see the result of those three injections on this case of specific neuro-retinitis, and he found the remains of a choro-retinitis luetica. As for the

neuro-retinitis, it has receded so much that there remains only a slight redness of disc, no swelling, veins are slightly enlarged and arteries a trifle smaller than normal; but what is significant is the marked central scotoma both for red, green as well as blue. This may denote a possible beginning optic atrophy without the visual signs of pallor of the disc being present viz.: a sequel of the former optic neuritis. So as to exclude a possible but not very probable cause of scotoma; tobacco amblyopia; smoking was interdicted to see what effect, if any, that will have.

The great impairment of vision from which he now suffers is due to the scar and exudate left in the macular region by the choro-retinitis. Here can be seen large areas of choroidal atrophy surrounded by pigmentation and exudation.

*Case No. 11784.*—German, clerk, age 38. Had intercourse September 4th. September 23rd came for treatment and examination revealed small chancre near the frenum.

Wasserman test taken on September 24th shows ± which means doubtful. Intravenous injection of gm. 0.40 garyl and inunction of Calomelol (Heyden). One week later the chancre had formed a cicatrix and softened and is considerably bleached. Another intravenous injection of gm. 0.45 garyl and inunctions continued for another week. The chancre disappeared completely bleached, lymphadenitis on left groin disappeared also. All medication stopped for one month then a Wasserman test shows — on November 8th.

This was a typical case of primary syphilis and it was cured by 2 injections. I have advised the patient to continue the inunctions alternated with moderate doses of potassium iodide and to have his blood tested in six months.

*Case No. 1636.*—E. L. Syphilis of 12 years' duration in married woman 35 years of age. Came to be treated after a four months' miscarriage. Complained of eczema on the palmar surface of both hands. History elicited syphilitic infection several months after marriage. Husband denied any infection immediately before marriage but admitted having had chancre 5 years before for which he took a severe course of mercurials and iodides. After marriage when confronted with wife's sickness, he

took another course of inunction and internal medication and never had any recurrence. Wassermann test taken lately—negative.

The wife's physical examination showed secondary syphilis on both palms, glands enlarged in groin, axilla and submaxillary region. Tonsils large and easily irritated. Conjunctiva red, eyes slightly myopic, conjunctivitis is relieved by washing with bichloride 1-10-000 and iodine internally. Her headaches are frequently relieved by iodides internally. Constipation relieved by salines. Menstruation painful, dark clots and fetid, relieved by intrauterine dilatation and application of iodine followed with ichthyol tampon. Prescribed calomelol ointment inunctions on neck, axilla, elbow, groin, and back of knees. The hands were massaged with the ointment and covered with gloves all night. Every other day a sulphur bath containing a quarter of a pound of potassium sulphide in bath of hot water. She was given some intramuscular injections of mercury, oxyeyanate gr  $\frac{1}{4}$ . The patient felt somewhat relieved after these injections and the palmar eczema was relieved with ointment. The following year a Wasserman reaction showed + + + + and she was given 25 intravenous injections of a compound of mercury, arsenic and salicylic acid. The Wasserman test taken a year later showed positive. The conjunctiva was very much injected; the nervous system seemed somewhat debilitated. Patient was given 40 cgm. galyl which produced fever, vomiting and diarrhea. A week later she was given 45 cgm. and this time a severe Herxheimer reaction occurred. Patient remained in the hospital for one week to recover from the eruption and fever. This is the only case where such a severe reaction occurred and I attribute it to the patient's condition.

*Case No. 7077.*—English woman, born in Lima, Peru, age 52, weight 160, widow for seven years, husband died of specific disease.

She came to be treated for cancer of right breast. I made a blood test June 25, 1913, result positive. I placed her on a mixed treatment for one month and gave her five injections of electroelenium intravenously.

I removed her right breast July 23rd, she made a rapid recovery, up in one week and home the second week.

September 28th, I gave her an injection of gm. 0.9 neosalvarsan.

October 5th, I gave her an injection of gm. 0.9 neosalvarsan.

October 12th, I gave her an injection of gm. 0.40 1116 intravenously.

The third injection came out of the vein and caused a somewhat painful slough and therefore brought the treatment to a stop until healing is perfect. This patient is somewhat stout and has small deep seated veins. The next treatment should be intramuscular, in oil emulsion. She is getting calomelol inunctions, alternated with K. I. She complains of intense itching, which has been relieved with hot sulphur baths,  $\frac{1}{4}$  pound potassium sulphide to each bath. The blood test taken two months after the last dose of anti-syphilitic medicine given shows doubtful which means that she requires a little more treatment until it is negative.

*Case No. 11859.*—M. B., female, negress born U. S., age 25, laundress, single. Was infected at 14 with both syphilis and gonorrhea. Came to be examined on the 23rd of September, 1913. Wasserman test taken shows + + + + and doubtful reaction for gonorrhea.

Patient complained at the time of the examination of intense itching in the vulvar region. Glands infiltrated, secondary symptoms all over the body such as papular rash, tonsilitis, headache, lymphadenitis, etc. She was given 40 cgms. of galyl intravenously, given blue ointment by inunction and potassium iodide in one gram doses. At the end of a week the itch subsided somewhat, the papular rash disappeared and she came back the following week, got 45 cgms more of galyl intravenously and was instructed to report for treatment every week. Unfortunately, owing to the characteristic carelessness of her race, the moment she was freed of the disagreeable and visible symptoms of the disease, she discontinued the treatment. From the clinical evidence I am quite certain that two or three more injections would have cured her.

*Case No. 2852.*—L. R., French, age 36, chemist. Came to be treated in March, 1913. Physical examination showed an ulcer at the angle of the mouth and tip of the tongue. It was diagnosed at the French hospital as a smokers' cancer, the man being an inveterate smoker. Patient admitted hav-

ing contracted gonorrhea some years ago while in the army but denied ever having been infected with syphilis. A Wasserman test taken on the 23rd of March showed ++++.

The patient was given a mixed treatment and occasionally some intramuscular injections of mercury.

In September, 1913 he was started on garyl intravenous injections, beginning with 40 going up to 50 and then continued at 50 cgms. per week until he had received six intravenous injections. His symptoms in the beginning were very peculiar. Each injection caused some marked congestion in the face. His voice became hoarse, eyes watery. The mucous membrane of the nose puffed so that he could not inhale through the nostrils; slight headache and a mild nausea. After the second injection the so-called cancer of the lip and tongue which was to be operated upon on account of its malignancy, disappeared entirely.

The patient had a sallow pasty complexion which became rose and vigorous. The headache and buzzing in the ears disappeared and the weight was considerably increased. Patient had no ambition, owing to a debilitating effect of the disease as well as the prospect of a painful and disfiguring operation.

A blood test taken two months after the sixth injection of garyl shows negative.

Patient is remarkably improved but still I will keep him on the mercurial treatment, alternating with iodides, for another year because his wife suffers from a combined syphilitic and gonorrhreal infection and does not take treatment. I believe it will be necessary to continue anti-syphilitic treatment on this man to prevent reinfection. If we consider him cured, such a condition as reinfection is possible and I believe that the occasional use of garyl combined with mercury ought to produce a reasonable amount of immunity.

*Case No. 8297.*—A. P. S., Greek, age 43, single, coffee dealer. Complained of pain in the head, buzzing in the ears, chills and fever, pains along the spine and was suffering from mercurial stomatitis. He brought with him a report of the Wasserman reaction taken on July 23, 1913 showing +++.

He had been treated indifferently by another physician with mercury by intramus-

cular injection of mercury salicylate which no doubt caused the stomatitis.

The past history shows that the man became infected 22 years ago and the only treatment he received was 21 mercurial injections. I took his blood pressure and found to my consternation that it was beyond 300 but upon further questioning I found that he was a man who had to sample numerous brands of coffee prepared in the Turkish fashion which contains a considerable amount of coffee powder in the cup, and being a very heavy feeder, that may have accounted for the extraordinary high pressure.

The first injection I gave him was a dose of gm. .9 neosalvarsan. He complained that after this injection his headache was worse. A week after that I gave him gm. 4 garyl. This did not cause any headache but slight nausea. A week later he reported that the pain in the head and spine was entirely gone and he received another injection of gm. 45 garyl. He reported that his headache was gone and he was feeling remarkably better and he was encouraged to keep on with the treatment. The following week he was given gm. .5 garyl and some potassium iodide by mouth in large doses beginning from one gram three times a day increasing to four grams three times a day. After the medicine was given to the point of iodism, it was stopped and a course of alkaline sulphur baths prescribed together with one Turkish bath weekly. His diet was also regulated so as to eliminate the toxic effect of coffee and alcohol. The obesity was treated with thyroids so that at the end of a month his blood pressure was reduced to 160 and his weight was decreased by ten pounds. The patient however, suffered from a certain amount of sexual neurasthenia.

A month after the last injection of garyl another blood test was taken which showed + weakly positive.

The patient has been given some intravenous injections of mercury cacodylate gm. .06 twice a week for a month and also some stimulating remedies containing the glycero phosphates and strychnine combined with a small quantity of thyroids and he has been given 3 injections of neosalvarsan because my supply of garyl had become temporarily exhausted. The impotence is nearly cured and the clinical symptoms of syphilis have disappeared.

The third blood test taken a month after the last injection was given, proves negative. However, the patient is kept on a preparation of mercury for another month. This preparation is composed of the mercuric and mercurous sulphids, calcium sulphid and calcium carbonate. The minimum dose of these three substances is incorporated in one capsule, namely, one-quarter of a grain of mercury, one-half grain of the calcium sulphids, and given at bed time.

*Case No. 12395.*—A. L. L., age 50, French, machinist. Became infected about 20 years ago with both gonorrhea and syphilis. The patient is a well nourished man who has suffered as a child from hip joint disease with the consequent wasting of one limb. In addition to that, he suffers with gonorrhea, arthritis and syphilitic periostitis in the right elbow, left shoulder, left hip and right knee. He has been suffering a great deal for the past five years.

About a year ago he went to a physician who gave him an intravenous injection of salvarsan by the open method and he was told that he was cured. Unfortunately the pains refused to stop upon that physician's order and when I took a blood test it showed +++. The patient received three injections of garyl, beginning with 40, finishing with 50 and received between times some injections of mixed gonococcus vaccines, static electricity, lucodescent lamp treatment over the painful areas.

This case is one of those refractory cases inasmuch as three months after this strenuous course of treatment, his blood shows +++. His sexual powers were increased. Thinking perhaps there might be some cerebral syphilis, I had his eyes examined by Dr. Archie L. Oberdorfer, and the result is as follows:

I find vision R. 220-70 L. 20-20.

Fundus negative except signs of an amblyopia in the right eye probably congenital.

Field of left negative.

In conclusion I would summarize by saying that there is nothing in this man's eye ground that would suggest lues.

Dr. Archie L. Oberdorfer.

The patient has had four injections of atoxic gonococcus vaccine made by the Pasteur Institute of Tunic, according to Dr. Nicolle, and this vaccine has somewhat relieved the pain but not altogether abolished

it, owing no doubt to the mixed nature of the disease, tubercular, syphilitic and gonorrhreal.

I have advised this patient to rest in bed for one month while taking some further treatment with the hope that it might be more effective under those conditions.

*Case No. 13425.*—J. E., Hungarian, 35, became infected ten years ago while in the army with syphilis. Was treated in the usual way by inunction. Has been operated on both in Vienna and New York for appendicitis, gastric ulcer and duodenal ulcer. He has received several injections of salvarsan and when I examined him he showed symptoms of gumma of the stomach. Wasserman test taken on the 7th of October shows doubtful, which knowing that it is a positive case of syphilis, indicated further treatment. He was given one injection of garyl and some suppositories containing mercury gm. .06, some potassium iodide and essence of pepsin by mouth with the result that most of his pains were relieved. Patient has since left the country so that it is impossible to find the terminal result.

*Case No. 12558.*—P. V., age 35, clerk, occupation club manager, single. Nine years ago had a chancre for which he was given the usual mercury and potassium iodide treatment.

Six years ago he was infected with gonorrhea. Present history shows two secondary syphilitic spots on right leg, syphilitic laryngitis and tonsillitis. Blood test taken on the 29th of August shows +++ and doubtful reaction for gonorrhea.

Patient received one injection of garyl per week beginning with gm. .4 going up to Gm. .5 until he had received six injections. In the meantime he was given potassium iodide in large doses as well as inunctions of calomelol, tablets of mercury protiodide gm. .01, three times a day and Turkish baths weekly. Every three days a hypodermic injection of mixed vaccine for gonorrhea which stopped the gleety discharge.

The secondaries on the leg have been bleached out and the patient may be considered clinically cured.

The blood test taken six weeks after the last injection of garyl was given shows negative. There are two eczematous spots on one leg which are due to varicose veins. An ointment containing an organic arsenical com-

pound has been prescribed which will eliminate this last trace of the severe syphilitic infection.

*Case No. 13646.*—E. J. K., age 37, Greek. Became infected with syphilis 17 years ago. His disease ran an uneventful course and he took no treatment for it, until the fall of 1913. A Wasserman test taken in October gave +++. He was given ganyl at weekly intervals, beginning at 40, 45 and 50 and mercury proto-iodide by mouth during the course.

He has been complaining of headaches and buzzing in the ears and other manifestations of tertiary syphilis. He is a patient who is somewhat careless as to his personal hygiene; will not take his medicine regularly, occasionally drinks alcoholics and does not get a sufficient quantity of food or sleep so that I have been rather doubtful as to the success of the treatment in his case and I propose to have a Wasserman test taken before continuing.

The result of the test taken on January 28th, 1914 shows +++. From this second test we may infer that this case is one of malignant syphilis which resists treatment by arsenic and therefore would suggest a more intensive mercurial saturation before any more ganyl is given.

I have since then given him some capsules of mercurous and mercuric sulphid, calcium sulphid and calcium carbonate which shall determine after a month whether he is sufficiently saturated with mercury to give him a few more injections of ganyl.

In conclusion I would say that the blood is not immediately influenced by the administration of ganyl. The Wasserman reaction changes 15 days after the administration, therefore I have yet a month or more before taking another blood test.

Some authorities recommend that all of these arsenical preparations should be given in an oily emulsion and intramuscularly. Results at my hands have been so painful that I have not tried it very often and will only use the intramuscular injections on those who have veins not sufficiently large for injection.

It is true that the action of the medicine is more prolonged when given intramuscularly and three or four injections given in the muscles will act as well as eight or ten given in the veins but the rapidity of action

I believe to be an advantage and therefore I recommend the intravenous method even though it is wasteful, but my reasons for using it are the absence of pain and a quick saturation of the blood plasma with the anti-syphilitic remedy.

The presence of phosphorus in ganyl prevents, to a great extent, the neurotropic symptoms found in other organic arsenical preparations and besides it is a nerve tonic and aphrodisiac.

Three cases who were men above 40 and who were very much depressed sexually reported a decided improvement in that respect.

With one or two exceptions, every patient was not confined to bed after the injection so that it can be used in the ambulatory treatment of syphilis either in the office or dispensary. Patient in most cases can go back to work after receiving an injection.

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## IS ANTITYPHOID VACCINATION HARMLESS?

(*A Clinical Contribution.*)

BY

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A review of the literature of the past few years reveals splendid achievements in the prophylactic fight against typhoid fever and the high death rate justifies all efforts to stamp out such a harmful disease. The problem of immunization against typhoid fever, once restricted to laboratory and experimental research (Wright,<sup>1</sup> Chantemesse,<sup>2</sup> Vincent,<sup>3</sup> Brieger,<sup>4</sup> Bessau,<sup>5</sup> Mayer, Levy and Bruck,<sup>6</sup> Pfeiffer and Bessau,<sup>7</sup> Landouzy,<sup>8</sup> Rosario<sup>9</sup> and others), long ago became an important practical weapon in the fight against the bacillus of Eberth. Applied with great success in the domestic and colonial armies (Leishmann,<sup>12</sup> Firth,<sup>13</sup>

Chantemesse,<sup>2</sup> Russell,<sup>14</sup> Randolph,<sup>15</sup> Love,<sup>16</sup> —g 2 C. S. Butler,<sup>17</sup> F. P. Foxworthy.<sup>18</sup>

The method of course did not fail to encourage its introduction as a successful means of protection among physicians, nurses, medical students, and all persons exposed to the dangers of typhoid infection. (A. Meyer<sup>19</sup>, Joslin and Overlander<sup>22</sup>, Hatchel and Stoner<sup>21</sup>). Different Boards of Health successfully investigated the problem (New York, Maryland<sup>43</sup>, North Carolina<sup>80</sup>, Cincinnati<sup>62</sup>, Paris<sup>83</sup>, Virginia<sup>47</sup>, Department of Seine<sup>84</sup>, Budapest<sup>85</sup>, and others) and so the method proclaimed as a harmless one is recommended for more extensive application (R. Blue<sup>76</sup>, R. E. Ebersole<sup>56</sup>, Freeman<sup>61</sup>)\*. It is evident, that with the favorable impression prevailing, we may forget the opinion expressed in foreign circles about the untoward effects observed in cases treated with antityphoid vaccination. As in every new movement several years of careful observation are required before we can fully judge the situation, so also in this instance and as a contribution to the consequences of the prophylactic treatment against typhoid bacilli the following observations may be mentioned.

\*W. Broughton Alcock (23), Metchnikoff Besredka (24), Petrovitch (25), Josue et Belair (26), Deltell, Negre, Raynaud (27), C. Andriescu a. Ciucu (28), M. a. Brodet (29), A. Fadini (30), Besredka (31), Negre (32), Liffran (33), C. Nicolle (34), R. Lafarge (35), L. Guignon et Malarte (36), Comby (37), E. Briau (38), C. Nicolle, A. Conor, E. Gonseil (39), Spooner (40), P. G. Weston (41), A. P. Hitchens, A. G. Hausen (44), I. H. Young, (45), L. Reppert (46), C. J. Hunt (48), W. Shimmer (49), W. V. Gullick (50), J. N. Force (52), W. H. Watters (53), A. Dotty (54), G. V. Rukke (55), Congres Francals d. Médecine (57), Phalen (58), D. J. Davis (59), Maverick (60), T. T. Gibson (63), A. Rodet (64), J. C. Cornell (65), S. A. Milliken (66), J. D. Seba (67), J. S. Kahn (68), R. A. Marsh (69), R. C. Apted (70), J. W. Armistead (71), J. A. Fason (72), M. R. Stone (73), (74), E. O. Jordan (76), F. R. Torres (81), S. Deasy, F. L. Grapiolo, V. Fosati (82), (92), (93).

The case was observed by Dr. F. M. Sloane at Eudowood, to whom I am indebted for the interesting data. The patient is 30 years of age, a militia lieutenant at the Maryland encampment and enjoyed good health until June, 1912, when he had to submit to typhoid vaccination. Three days after the 3rd dose the patient started a violent reaction with high temperature, was confined to bed for 3 weeks, troubled with drenching sweats, lost 20 pounds, had slight cough and expectoration in the morning and appetite was poor. These manifestations were attributed to the typhoid vaccine, but the persistence of the temperature could not be explained for such a long period as being due to typhoid, so a colleague\* was called in and he found active pulmonary tuberculosis. Patient went to Eudowood sanitarium Sept. 4, 1912. At first he stood the air treatment very badly. Sept 14, a physical examination revealed:—In front: right apex: retraction, down to third interspace, with harsh bronchial breathing and whispered voice as far as middle right lobe, over left side, a few crepitant rales, over right lung, in back harsh breathing, crepitant rales and whispered sounds, left lung in the back a few crepitant rales and harsh breathing.

At first the patient's condition was very alarming, so an artificial pneumothorax was performed Jan. 25, 1913. The sputum examination April 2, 1913 showed a Gaffke VI and until Sept. 19, 1913, a Gaffke II. After the pneumothorax treatment the expectoration ceased completely. The temperature when admitted to the hospital was 101° with exacerbations in the afternoon until October, 1912. After the pneumothorax treatment the temperature remained below 99° and stayed so, a few occasional colds excepted. The general and local condition has improved considerably and he is able to work on the farm for 10 hours daily.

As no tubercular history could be obtained, the question arises whether tubercular infection resulted as a consequence of the antityphoid vaccination, or whether the latter treatment was a suffi-

\*Dr. Gordon Wilson (Baltimore).

cient cause of the reactivation of an old, quiescent lesion. The first possibility is not very probable, since the physical findings, the retraction of the right apex, the harsh breathing, whispered voice speak in favor of an old process, which must previously have escaped recognition.

This single fact, gathered from among thousands of successful typhoid vaccinations must seem surprising but in going over the literature of the past few years, there are a few less optimistic opinions and failures recorded. (E. Allenbach<sup>79</sup>). It is the general opinion, that besides the necessary reaction following the antityphoid vaccination, these manifestations are of no further consequence for the individual. H. Mery<sup>80</sup> mentions a transient cardiac relapse observed during the vaccine therapy of typhoid fever, Socquée and Chevrel<sup>81</sup> though in favor of the vaccine treatment leave some doubt as to its inoffensiveness. J. Louis and E. Combe<sup>82</sup> however caution against the indiscriminate use of the treatment, where any suspicion of a dormant or active pulmonary tuberculosis exists. From their experience with Vincent's polyvalent vaccine they maintain that anti-typhoid vaccine is able to cause a similar effect as a tuberculin injection. Recently in the Société de Médecine Légale<sup>83</sup> the question of compulsory antityphoid vaccination in the French Army was discussed with the statement, that notwithstanding the careful elimination of unhealthy recruits of about 7,000-8,000 per year, the possibility could not be discarded that some of the recruits dismissed from the army on account of threatened or incipient tuberculosis, who previously had been vaccinated against typhoid, might enter suit against the state, as being convinced that the anti-typhoid vaccination had caused their pul-

monary disease. Although such conditions may not be observed frequently, the law for the compulsory antityphoid vaccination for the army was changed so that the administration of the vaccine is left to the individual impression of the army surgeon in the given instance, whether or not to vaccinate<sup>80</sup>. See Granjux<sup>85</sup>. Also some opposition was encountered with regard to the compulsory protective treatment among the nurses in Paris, based upon the report of the death of two sisters after anti-typhoid treatment<sup>81</sup>. The recent charges that the vaccine was the cause of one death and the illness of two children who acquired typhoid after vaccination, have been investigated by Dr. S. S. Goldwater<sup>78</sup>, who reported that the imputations were not based upon the real facts.

Granjux<sup>85</sup> is against compulsory typhoid vaccination and he mentions the possibility that physicians and health officers may in vaccinating their patients neglect the improvement of defective hygienic conditions. Statistics in armies (F. Meyer<sup>84</sup>) show that besides prophylactic vaccination the strict observation of sanitary conditions is able to reduce the casualty and morbidity in typhoid to as low level as is usually attributed to the vaccination alone.

Personally, and based upon careful clinical examination of my hospital material (University of Maryland Hospital) it seems to me, that incipient tubercular lesions are easily overlooked, that many cases sent to our institution under the diagnosis of typhoid with pulmonary signs are not due to Eberth infection, but to a fresh or an activated old tubercular process. On the other hand not unfrequently I have seen tubercular changes of the lungs become active in the course of a protracted typhoid infection. Meyer<sup>84</sup> also in his

statistics has noted the frequency of pulmonary processes occurring in the course of an Eberth infection.

Among the cases of tuberculosis following typhoid fever I would mention only the following:

S. R., age 13, Hebrew school girl, entered the hospital Sept. 23, 1912, and stayed at institution until Dec. 6, 1912.

Parental history negative; one brother living and well, one brother dead from otitis media, was operated twice and died after second. Three sisters living and well, one sister died at age of 3 weeks, cause unknown.

The patient had measles at the age of 6, negative to other infectious diseases; no menstrual history, present illness started with pains in the abdomen, severe frontal headache, general tiredness and exhaustion. These symptoms began about one week before entering hospital. Bowel movements 4 times a day, diarrheic without any blood. Chills and fever mostly observed during night, sleep restless, awakes often with high temperature. Appetite poor, no other digestive complaints. Pulmonary symptoms negative so far as cough, expectoration, pains in chest are concerned. Circulatory, genito-urinary manifestations negative; no nervous manifestations except dull headache.

Physical examination on Sept. 26, 1912. Pulse 120, temperature  $102\frac{1}{3}$ , respiration 22, patient—white girl lying in dorsal position, facial expression anxious, but not painful. Head negative, pupils dilated, react equally on light and on accommodations, slight anemia of the conjunctiva, other findings normal. Ears normal, tongue coated and broadened, palate high arched and V shaped, pharynx glazed and injected; teeth normal. Neck—marked pulsation of carotids, submaxillary and post-cervical glands palpable, no muscular rigidity; chest—symmetrical expansion on either side, no increased tactile fremitus, slight impairment of percussion sound over left apex from second rib upwards, left apex with harsh tubular breathing upwards from 3rd intercostal space. Percussion over left apex posteriorly seems normal, also palpation. On auscultation over left apex posteriorly, granular inspira-

tion and crackling expiratory rales after cough. Roughened inspiration extends as far as 6th dorsal spinal process. Posteriorly over right apex pectoriloquy, inspiration granular, roughened expiration extends down as far as 4th dorsal spinal process. Heart—apex beat not visible, no thrill on palpation, absolute cardiac dullness extends to  $2\frac{3}{4}$ " to left of midsternal line in 4th interspace; upper limit upper border of 3rd rib, right sternal margin. On auscultation, sounds at apex: loud, clear, of booming quality; accentuation of 2nd pulmonic; no murmurs noticed.

Spleen just palpable; kidneys not palpable. Inguinal glands enlarged, lower extremities negative, knee jerks not obtained; Kernigankle clonus, Babinsky absent, plantar reflex normal. Upper extremities normal, no glandular enlargement nor clubbing of nails.

Liver—superficial dullness begins at 6th rib, deep dullness at 4th rib extends to costal margin in mid clavicular line.

Abdomen distended, epigastric angle small, acute; tympanitic note of percussion; no areas of tenderness nor of muscular rigidity.

Laboratory findings Sept. 26. Urine—light straw color, acid reaction, specific gravity 1,012, albumen slight ring, sugar negative, sediment, urea, 16.5 grams large amount of pus cells, granular casts and epithelial cells. Oct. 12, specific gravity 1,016, albumen and sugar negative, no casts, few pus cells. Oct. 16, specific gravity 1,010, slight ring of albumen, few granular casts and mucous shreds. Diazo-reaction positive.

Blood—9/25/12. Red blood cells 4,400,000, white blood cells 6,200, polymorphonuclear 71%, small mononuclears 25%, large mononuclears 4%, Widal positive, Bass-Watkins negative. 10/12, leucocytes 6,000, hgb. 82%; 10/24/12, Widal positive, blood pressure; 9/27/12, systolic 94 mm. mercury, diastolic 54 mm. 11/3/12, systolic 96, diastolic 60.

Sputum examination on 9/26 and 10/19 negative for tubercle bacilli. Feces on 10/12/12 semi-solid, light brown color, occult blood negative and digestion normal.

Patient was put under ordinary typhoid precautions with typhoid diet.

Temperature chart. During first week temperature oscillated between 103, 101,

105° with accelerated, rapid pulse, varying between 100, 120, 140 pulsations. Respiration varied between 20 and 35 a minute.

During 2nd week a tendency to lower temperature was observed with maximum evening temperature 100.3/5°, morning temperature 98°, pulse gradually comes down from 118, 122 to 85.

In the 3rd week the temperature rose again with maximum elevation to 102, 104 with daily fluctuation of about 4°, pulse and respiration are equally increased.

With the beginning of the 4th week the temperature still remains high, fluctuating, septic, with maximum evening elevation.

Pulse also remains irregular, mostly between 120 and 130.

After the 5th week the temperature gradually came down, oscillating between 100 $\frac{1}{2}$  and 97 $\frac{1}{2}$ . The temperature with an occasional rise to 99 $\frac{1}{2}$  became normal. Pulse rate, however, always was above 100, reaching 103. Respiration was slightly increased, occasionally coming up to 30.

*Bedside Notes.*—10/1—No roseolic spots visible, spleen just slightly palpable under costal margin, patient is doing relatively well.

10/9—With rise of temperature spleen becomes distinctly palpable, 2 fingers below costal margin, abdomen slightly distended.

10/11—A slight blowing murmur is found over apex without transmission to axillary line.

10/14—Absolute cardiac dullness in 4th interspace 3" from midsternal line, at apex first sound followed by a soft blowing murmur; 2nd pulmonic accentuated. Respiration increased.

10/17—Slight hemorrhage from nose coincident with a rise of temperature; abdomen moderately distended; administration 10 minims of adrenalin t. i. d. Blood found in feces.

Percussion note impaired above right clavicle, breath sounds and expiration increased, marked pectoriloquy over this area, very fine rales on deep inspiration; following expiratory cough similar rales noted in right super spinous fossa, no mediastinal dullness noted. Over left apex expiration roughened, pectoriloquy as far as 4th dorsal spinal process. Pulse ranges with temperature, varies between 80 and 120. General condition of patient—mark-

edly underdeveloped with underweight. Over abdomen 1 or 2 atypical rose spots are noted. Diet—ordinary typhoid liquid diet. Over outer aspect of both arms there is felt a roughening, which is not noted elsewhere over the body. Careful examination shows that this roughening is due to small papules  $\frac{1}{2}$  mm. in diameter, which seem to arise from the follicles. These elevations are only noticed after close inspection, and on account of the same color as skin they strongly resemble Van Pirquet's description of *tuberculides*.

11/18—Patient is up in chair, pulse accelerated, irregular, apex beat in 5th interspace one finger outside of midclavicular line. Upper limits, border of 3rd rib  $\frac{1}{2}$ " to left of sternal border. Heart sounds of medium intensity, accentuation of 2nd pulmonic sound, no murmurs.

Pulmonary findings—impaired percussion over both apices in front, extending at right down to the 2nd interspace, at left to the 1st interspace with harsh, prolonged expiration and crackling inspiratory rales spontaneously and after cough; pectoriloquy over right apex, bronchophony over left apex. Posteriorly the findings are the same as recorded.

On Nov. 28th there is still noted a lack of expansion over the right apex, impaired percussion sound over right apex down to the 2nd rib in front; to a lesser extent over left apex. The character of breathing over the entire front is puerile, especially over the left lung, upwards from 3rd rib, where the left apex shows distinct prolonged expiration, a few expiratory rales are noticed over same area and pectoriloquy.

Discharge noted on 12/6. Patient leaves hospital fairly well recovered, temperature and respiration about normal, pulse rate remains always accelerated. A few weeks after she had left hospital an urgent sick call was sent in, as she had an abundant pulmonary hemorrhage. A comparison of the physical pulmonary findings in the reported case (as obtained on 9/26, 10/17, 11/18, 11/28,) in addition to the skin changes, the pulmonary hemorrhage gives rise to several questions. Notwithstanding the absence of any antecedent tubercular history of the patient, it is probable, that some time previous, the girl was subject to tubercular infection and it is likely

that the restricted diet, added to the lowered resistancy, following the typhoid infection, furnished favorable conditions to all activation of the pulmonary process.

So far there have been no experiments carried out as to how tubercular infection may be influenced by typhoid invasion, but experiments of that kind are on the way at our institution. Further it would be desirable to control the cases with regard to existing pulmonary tuberculosis or with a disposition to such manifestations, previous to, during and after typhoid vaccination. Should it in the course of time be possible to furnish more substantial proof for such a relation existing between these two diseases, (the solution of which question of course could be greatly helped by the collaboration of the medical profession engaged in sanitaria, asylums, hospitals, etc.) an important question for the general welfare would be answered. It also would be advisable to admit among the contraindications to typhoid vaccination besides old age, cachectic chronic conditions, arteriosclerosis, cardiac and renal diseases, as endorsed by Hachtel and Stoner, cases of incipient tuberculosis. In making such restrictions, when we consider the extreme frequency of tuberculosis, if a careful physical examination is made, a great number of individuals would miss the advantages of the preventive typhoid immunization, provided that the same doses of vaccine as for healthy persons is given. In typhoid cases, particularly in protracted, relapsing forms of that disease, the feeding with more calories has to be recommended, since experience has shown, that with the proper selection of fluid food of a higher caloric value, the patients may overcome the injuries of the disease in a shorter period, without increase of the danger arising from

complications. Later should careful physical examination of the chest reveal an reactivated lesion, then diet, exercise and all hygienic rules have to be observed and enforced.

The present paper is far from minimizing the undoubtful merits of a method which properly carried out has not only saved millions of expenses by loss of wages and time, but it has also preserved to a great extent the lives of our soldiers from disease. Every new method enthusiastically endorsed, is not absolutely exempt from inconveniences, which will become more apparent in the course of time. In our aim to preserve human life from unnecessary suffering, we try to obtain a method which is most effective but not injurious.

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## THE ANNOTATOR

**Sea Catastrophes.**—Collisions at sea are becoming sufficiently numerous to warrant an exhaustive investigation. We doubt whether there are many more now in proportion to the number of ships in service, than fifty years ago. The only point we need consider is the fact that safety at sea is not increasing with the constant improvement in the rules of navigation. After all is done in this line, safety still depends upon the one finite and fallible mind in control. If the captain blunders, all is lost. We have frequently mentioned the accidents due to the old age of masters, but now the younger men are making costly errors. Can we not make rules which will compel the master to share responsibility so as to make it incumbent on him to listen to the judgment of his subordinates? We hear very disturbing stories also that certain masters, in order to save a few hours time and a few tons of coal, are in the habit of leaving the prescribed lanes, and that they do this with the connivance and approval of the owners. If this is so, a few men should be jailed to end the custom. Perhaps a jury might vote to hang one or two of such criminals.

**The Fear of Premature Burial.**—The fear of being buried alive should be classed with the psychoses. Many years ago the books on physiology and medical jurisprudence seriously discussed the possibility of being buried alive and gave many facts which seemed to indicate that the grawsome accident did occur. In those days there was some excuse for the widespread belief that people were frequently buried alive. The alleged evidences



have since then been shown to have been due to other causes and we ceased to talk about it. It was also shown that the supply of oxygen in a coffin is not sufficient to sustain prolonged consciousness and the grawsome details we once read are wholly imaginary. Children and neurotics were especially impressed by the horrible stories and no doubt suffered keenly at the thought of what might happen to themselves. At present the idea has assumed much of the nature of a delusion, for it is kept alive by neurotics whose wild statements indicate abnormal mental processes. The last one is a Miss Hoskyns-Abrahall who has been given space in the Athenaeum for some "scientific" articles on death. She states that in nearly every coffin exhumed, there was evidence of a struggle, and that nearly everyone is buried alive but is revived from apparent death by magnetic and radioactive powers of the earth. Such nonsense can do no good and does great harm when read by nervous impressionable children. We hope that editors, as a matter of humanity, will suppress such vagaries or use them as we do the delusions of the insane—merely for diagnosis of the mental state of the mind harboring them.

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**Are All Men Alike?**—The alleged basic identity of human races is claimed by Prof. Franz Boas of Columbia University, New York City.

He says that all European populations are a mixture of numerous types which have amalgamated successfully and that there is no biologic objection to the marriage of Japanese and Europeans. If this is true, then negroes and whites could fuse, but the experience of the medical profession is that they cannot amalgamate to form a permanent type, because the mulatto proves to be of weak material, susceptible to disease and unable to stand surgical trauma. The reason seems to be the lack of physical adjustment to the environment. Each parent is adapted to a certain climate and decays in places markedly different from the normal, but the



mulatto is a mixture which is not adjusted to any place on earth and hence dies out anywhere before either parent stock. The same facts are found in mixtures of races not so widely separated. Types do not mix so much as Boas thinks. We recognize them in Europe because they do persist, though each intruded type undergoes change by survival of the fittest variations. There has unquestionably been a great slaughter of the unfit to accomplish this adjustment and the hybrids are far less numerous than they would be if they were the fittest. The population of a place tends to become uniform and forms a certain type which is not a mixture. Boas had made himself notorious by praising the high mentality of the negro, and we must give scant courtesy to his present opinion as to racial unity. He has perhaps been unduly influenced by Zangwill's fantasy of America being a melting pot. Divergent types may marry here but cannot expect to produce a permanent new type. The future population of a place must be what the law of survival dictates. Southern Italians are vastly different from Danes, yet each land has been repeatedly overrun by invaders who have settled and married the "natives." Florida cannot expect to evolve the same type as Maine, and no amount of intermarriage will effect the final result in either place. We are afraid that the anthropologists need a little more biology if they approve of Boas. Races had better keep separate, as half-breeds are a nuisance to themselves and to each parent stock.

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**Sudden Deaths on the Golf Links!**—Deaths of old men on the golf links have been sufficiently frequent to warrant us in

warning our patients not to abuse this best of out-door games for those past middle life. The last victim is a well known artist who died from a ruptured aneurism. Most of the deaths seem to be due to a strain which throws the blood pressure temporarily above the strength of the vessels and either an artery bursts and the heart dilates or is unable to contract against the pressure. Few



people realize what an effort they put forth in making a long drive. The exercise between strokes is ideal for a damaged heart and arteries, and that is the very reason it tempts us to overstrain for a few seconds. If the effort were more prolonged we would not attempt to compete with boys whose elastic arteries are built for just such intermittent pressures. Though we retain our ability to put forth our full muscular power for a few seconds, no one over 40 or 45, perhaps no one over 35, should ever do it, and this is the temptation in golf. Men who cannot resist had better give up the game if they are in a very serious condition, but a mere warning will be sufficient for the rest. We do not advise people to give up riding in street cars because a few heart cases drop dead running for one. The wise take warning and as years pass we note a less and less tendency of grown men to run for cars or run up stairs, but the fools are not all dead yet.

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**The Falling Birth Rate.**—The steady reduction of the birth rate seems to be an instinctive response to the almost universal

conviction, that the later babies will prevent the rearing of the first ones born. In a large number of the published cases of families needing relief, it is noticeable that the parents have brought into the world more children than they can

support. We have long known that a tuberculosis mother can not be cured if she becomes pregnant, and it is considered proper therapy to teach her how to avoid conception, and it is now a standard practice to do this. Why not go a step further? Statistics in Germany show that the mechanic can support only three children and if he has more they must work for a living. If there are more than three below the working age all are in more or less want, and will need medical care in time as a matter of charity. What are we going to do about it? Continue to tell these inefficients how grand it is to have large families so that paid charity workers can have a reason for existence? Or would it be better to check



a poor man after his third baby is born in a charitable institution and his other two cared for until the mother is about. Why not tell him he has burdened society with enough, and if he can not prevent saddling further burdens on us, we will lock him up or sterilize him? We cannot kill surplus infants as our ancestors were compelled to do, but we can get after the worthless parents who bring them into existence. Only a few years ago medical societies were quite unanimous in condemning any measures for prevention of conception, but a great change is now noticeable probably as a result of our realization of the excessive harm done by frequent pregnancies. The Brooklyn Pediatric Society devoted the evening of May 27 to this subject and there was but little opposition to the proposition. In several parts of Europe the subject is openly approved and taught. The women are resenting the old habit of raising babies to swell the tide of emigrants in search of food. Governments are beginning to realize the drain of furnishing population for other nations, and Austria is trying to stop the outflow but will succeed only at the expense of increasing her poverty-stricken class.

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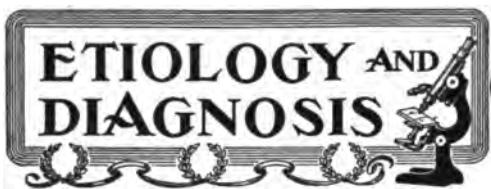
**Soda Fountain Dangers.**—Dirty methods at soda-water fountains must receive more attention from health authorities.

Frequent mention is made of the matter in the daily press and we must say that the complaints are often well founded. The glasses after being used are merely dipped in a sink of dirty water and are presented to the next customer with the greasy



lip marks of the last one still on them. In times of epidemics of infections of the throat there must be many cases contracted this way—indeed it is a danger at all times, not to mention the disgusting filthiness of the custom. It is so easy to install flowing water in an apparatus which will effectively cleanse the glasses, that we are surprised that all fountains are not thus equipped anyhow. Perhaps the patrons of these places might drive the offenders out of business by refusing to buy of them

and inducing their friends to join in a boycott for decency as well as good health. Then we might also take up the matter of flies, and force the merchants to so cover or screen the drinking utensils that patrons will not be compelled to use those which have had the dirty insects crawling over them.



**A New Method of Gastric Testing.**—Rehfuss (*American Jour. of Med. Sciences*, June, 1914) employs a simple capsule which can be easily swallowed and withdrawn at any given interval. In this capsule substances were placed capable of indicating the condition of the gastric juice. The capsule was made of hard steel, plated with silver. It consists of two parts: the head, perforated to permit the passage of a small silk thread, and supplied with a screw thread, by which it is attached to the body. This is likewise perforated and slotted to permit of the greatest possible ingress of liquid. Rehfuss found the best possible base was one of agar-agar. It is best to use a 2.5 per cent solution, as the addition of various coloring matters will soften it somewhat. Rehfuss used a 1 per cent aqueous solution of Congo red and agar-agar jelly distinctly alkaline after it has colored to 40 F.; the same solution added to hot agar-agar results in a precipitation of the dye.

Capillary tubes were prepared by drawing out ordinary glass tubing in the usual manner until the diameter approached 1.5 mm. These pipets were then kept ready for use, and when it was desired to perform a test they were simply plunged into the jelly, withdrawn, and a core of the substance remained in the tube. Pieces were then cut off, 8 mm. in length, and inserted in the capsule. The capsule was then given at any stage after a test meal or, after an ordinary meal, swallowed in the usual manner, with a little water, and allowed to remain in the stomach ten to fifteen minutes and then withdrawn, taking the precaution to tell the patient to swallow when the capsule reaches the root of the tongue. Rehfuss usually performs Mett's test *in vivo* by taking one of the capillary tubes, sucking up some fresh egg albumin holding the pipet over a boiling-water bath for two minutes, which results in a softly coagulated albumin capable of showing peptic digestion. Rehfuss has been able to demonstrate the digestion of more than 1 mm. for either end in the course of an ordinary Ewald meal.

While experimenting with the Einhorn duo-

denal tube, Rehfuss became convinced that if the tip was modified it would be possible to obtain acceptable specimens of the gastric juice. The new tip is slotted instead of perforated, and the slots are so cut that their diameter is as great as the caliber of the rubber tubing, in that way assuring the more perfect aspiration of material. It is made of steel, or can be made of manganese bronze; is bulbous in shape, so as to be easily swallowed; weighs from 90 to 120 grains, depending on the extent of the slotting and when linked with the customary No. 8 French tubing will not only serve as a most acceptable duodenal tube, but finds an even greater field in the study of the gastric contents, capable of being left in the stomach for long intervals, and enabling one to make a fractional study of the gastric juice over the whole period of digestion. The weight is sufficient to permit rapid swallowing, at the same time assisting by gravity its passage through the duodenum.

**Forms of Mental Anorexia.**—Anorexia is less a malady than a syndrome, common to several affections. (*Medical Press and Circular*, July 1, 1914). Its clinical forms are diverse.

#### Hysterical Anorexia.

The most frequent form, described years ago by Gull under the name of hysterical apergia, is anorexia observed in hysteria and accompanied by various troubles of the digestive tract (pain, repeated vomiting, hematemesis, constipation or diarrhea).

It belongs exclusively to the female sex and frequently develops at the age of puberty. It is this form in which said Gilles de la Tourette, "the patient will not eat because she will not eat." There is a cause that provokes this refusal to take food, generally a fixed idea, but difficult to diagnose.

Hysterical anorexia in its simple form gets well unless abandoned to itself, but in certain patients the stomach remains delicate for years if not for life.

#### Anorexia of Puberty.

All young subjects suffering from anorexia at the age of puberty are not hysterical, hence a syndrome observed in young girls having in their ascendants some mental disturbance (alcoholism, phobia, mental depression, etc.) These subjects present no signs, physical or mental, of hysteria. Unlike their companions, they are grave, object to noisy amusements, are listless, religious and sometimes mystic; they appear to be older than their age, and, at the moment of puberty, are observed to be sickly, their intellectual faculties diminish and are incapable of any effort even to mastication. At the same time they complain of painful sensations in the epigastrium, although the region is not tender to pressure.

Outwardly these patients present particular characters, the skin is dry, the nails brittle, the hair falls. To this may be added a change in the disposition, which becomes irritable with intermittent attacks of despair, and in exaggerated cases, with ideas of suicide.

The prognosis of this condition is grave. Relapses are frequent, and in some cases the patient falls into a chronic state that may terminate in death.

#### NEURASTHENIC ANOREXIA.

Anorexia can be met with in certain neurasthenic patients who from infection or grief producing dyspeptic troubles, diminish progressively their food and study the diverse sensations of their stomach. They are seized with a regular phobia of food and put themselves on the most reduced diet, they lose several pounds in weight, but are easily cured by isolation and psychotherapy.

#### HYPPOCHONDRIAC ANOREXIA.

In a superior degree, young nervous subjects with some hereditary antecedents lead themselves to believe, after one or several attacks of painful digestion, that they are going to be afflicted with ulcer or cancer of the stomach. Their mind is always pre-occupied with this eventual misfortune, they diminish their food, analyse their sensations and masticate conscientiously even to excess.

#### ANOREXIA OF MELANCHOLY.

This form is observed in young subjects who have undergone a change both as to character and disposition; they renounce the company of their friends, seek solitude and pass their time in complete inactivity. They restrain eating because they have lost taste for everything. No happiness exists for them, they have no desire to speak, to eat or do anything. This condition may last for months and be succeeded by a form of depressive mania with intermittent attacks of agitation.

#### ANOREXIA OF EARLY DEMENTIA.

Fear of being poisoned, mortification for some imaginary fault, fear of eating dangerous microbes, of catching the pretended malady of the person who prepares their food, are among the chief causes observed in persons suffering from mania.

Anorexia resulting from the different mental conditions described, says Dr. Feuillade, is about the same in every case. The consequent emaciation provokes the same cachexia with pallor of the skin, falling of the hair, coldness of the extremities, obstinate constipation and all the signs accompanying accentuated denutrition. The menses are suppressed and frequently signs of tuberculosis are observed. On this point it would be interesting to know if tuberculosis is the cause or the consequence of anorexia. It is logical, however, to suppose that the organism of such patients being in a state of denutrition bordering on cachexia, furnishes a favorable soil to the development of tuberculosis.

Anorexia of hysteria can be cured by isolation of the patients; the same treatment applies to persons suffering from neurasthenia and melancholia. But anorexia of hypochondriacs and certain melancholics is modified by the affection it accompanies.

The prognosis of anorexia of dementia is rather grave, the patient opposing to all efforts of the medical attendant and the family an indomitable negativism.



#### The New Dress of the Annals of Surgery.—

Owing to the continually increasing amount of material of value, offering for publication in the *Annals of Surgery*, the publishers have found it necessary beginning with the July, 1914 issue to enlarge the size of the page and also to somewhat reduce the size of type in which the original contributions have heretofore been printed. The enlarged size will also enable the publishers to make a better display of the illustrations which are such an important feature of the *Annals*' contributions.

Thirty years ago, when the first number of the *Annals of Surgery* appeared, the size and style then shown suited admirably. At that time a single number contained only 96 pages. They have continued to increase each year until now the average number of pages to an issue is 164. Special issues have been published in which the number has been increased to over 300 pages, with the result that the manufacturing of the journal in the former style is not only extremely difficult but the finished product is unwieldy and cannot be read with the ease and comfort which is due a subscriber. In fact, it required constant pressure on the pages to keep them open.

We believe the new form overcomes this inconvenience and enables the publishers to give the reader more material and greater comfort while reading than it could have been possible for them to present in the former size.

The July issue has a choice collection of important articles of exceptional value to the general practitioner as well as the surgeon. It is a splendid example of the way this publication continues to set the pace in surgery.

**The Family Doctor.**—The crying need in these times, says *The Charlotte Medical Journal*, July, 1914), is the all-round, general practitioner; as in these days of so many specialists, and such a vast number who practice surgery exclusively, the good old-time family doctor is a "rare avis."

The good old family doctor! What a place he held in the confidence, respect and adoration of the family. He was consulted on almost everything, physical, moral, social, and what not! He had a power, and influence in the management of the sick, as his patients believed implicitly in his solid, and practical judgment; that his brain was the foundation of unrunning wisdom; that he knew the temperament, constitutions, and idiosyncrasies of every member of a household; and knowing these he was successful in treating disease. They believed he

possessed sovereign remedies for all the ills of the flesh, and he was appealed to on all occasions. Experience and skill are indispensable; and they were accomplishments of the old-time family doctor, even if he did have only the crude medicines as his weapons against diseases.

They were so firmly entrenched in the confidence and veneration of their families, that they rarely were harassed by the meddlesome officiousness of outsiders; and consultations were never had except at the instance of the doctor himself. As a rule, they knew what to do in an emergency; and like the country doctor, they were thrown on their own resources. With but meagre text book knowledge, they cured the sick all the same. They got faithful and intelligent co-operation, and charitable allowance was made for any shortenings and failures.

The family doctor didn't rush in, and rush out, but tarried till he ascertained the true condition of the patient.

Now the question is, have we much better success today than had those physicians of long ago? True, we have now better concentrations, palatable elixirs, triturates, etc.; but results are not much better than they were fifty years ago.

Along some lines, we can do better than did our ancestors; but with the remedies of today, if used in ailments of long ago, would probably do no better than the remedies they used. Old-timers were heroic men, and their practice was heroic. They didn't let up as long as there was life, and stayed at the bedside till death closed the scene.

**Changes at the Rockefeller Institute.**—The Board of Scientific Directors of the Rockefeller Institute for Medical Research announces the following appointments and promotions:

Dr. Hideyo Noguchi, hitherto an associate member in the Department of Pathology and Bacteriology, has been made a member of the Institute.

Dr. Alfred E. Cohn, hitherto an associate in medicine, has been made an associate member for the term of three years.

Dr. Wade H. Brown, hitherto an associate in the Department of Pathology and Bacteriology, has been made an associate member for the term of three years.

The following assistants have been made associates:

Harold Lindsay Amoss, M. D., (pathology and bacteriology).

Arthur William Mickle Ellis, M. D., (medicine).

Thomas Stotesbury Githens, M. D., (physiology and pharmacology).

Israel Simon Kleiner, M. D., (physiology and pharmacology).

Alphonse Raymond Doclez, M. D., (medicine). Dr. Doclez has also been appointed resident physician in the hospital of the Rockefeller Institute to succeed Dr. Swift. Dr. Homer F. Swift, formerly resident physician in the hospital of the Rockefeller Institute, and associate

in medicine, has been appointed associate professor of medicine at the College of Physicians and Surgeons, Columbia University, and associate attending physician, Presbyterian Hospital.

The following fellows have been made assistants:

Frederick Lamont Gates, M. D., (physiology and pharmacology).

Louise Pearce, M. D., (pathology and bacteriology).

The following new appointments are announced:

Chester Harmon Allen, M. S., fellow in chemistry.

Alan M. Chesney, M. D., assistant resident physician and assistant in medicine.

Harold Kniest Faber, M. D., fellow in pathology.

Ross Alexander Jamieson, M. D., assistant resident physician and assistant in medicine.

Benjamin Schönbrun Kline, M. D., fellow in physiology and pharmacology.

John Jamieson Morton, Jr., M. D., fellow in pathology.

James Kuhn Senior, M. A., fellow in chemistry.

Joseph Richard Turner, M. D., fellow in pathology.

Dr. Paul Franklin Clark, formerly associate in pathology and bacteriology, has been appointed assistant professor of bacteriology in the University of Wisconsin.

The July number of *The Prescriber* is devoted to the subject of Radium Therapeutics. Articles on the latest developments of the subject are given, including the following:

"The Therapeutics of Radium," by J. R. Ridell, L. R. C. P., L. R. C. S. Ed. (Glasgow).

"Radium in Skin Diseases," by W. Knowsley Sibley, M. D., (London).

"Recent Developments in Radium Therapy," by W. Hope Fowler, M. B., F. R. C. S. Ed. (Edinburgh).

"The Pharmacy of Radium and Its Substitutes," by Thos. Stephenson, Ph. C., F. R. S. E. (Examiner to the Pharmaceutical Society).

Dr. Hope Fowler has acted as associate editor for this number, a fact which is a guarantee that the contents are up to date.

"The American Roentgen Ray Society will meet in Cleveland at the Hotel Hollenden on September 9th to 12th inclusive, 1914. The program promises to be of unusual interest, and includes a paper by Dessauer of Frankfort, on the subject of artificial production of gamma rays; Coolidge, the inventor of the Coolidge tube, Shearer and Duanne will also read papers. The subject of deep therapy and the production of the hard rays will be fully presented and discussed. The rest of the program will be taken up by a large number of papers on general subjects. The medical profession is cordially invited to attend these meetings."

# American Medicine

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PUBLISHED MONTHLY BY THE AMERICAN MEDICAL PUBLISHING COMPANY.

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Complete Series, Vol. XX, No. 8.  
New Series, Vol. IX, No. 8.

AUGUST, 1914.

\$1.00

YEARLY  
in advance.

**The benefit of the diminishing birth-rate** has been so conclusively proved, that it comes as something of a shock that a professor of economics, F. H. Hankins of Clark University should write about it as though it were something more or less harmful except in the poorest of families. (*Journal of Heredity*, Aug., 1914). There is no longer any question that large families intensify poverty. As a very general rule the smaller the income the greater the number of children. It seems that men too stupid to make a living are also too stupid to prevent burdening themselves with offspring. Nevertheless knowledge is spreading and the birth rate is steadily diminishing the world over in all social classes, with the result that a higher percentage of babies are reared. Economists like Hankins are deceived by the increase of food production through the settlement of the new world or by scientific agriculture. In the long run food production increases very slowly as Malthus first discovered. Population can increase only at the rate the food does. It is therefore impossible for more than a certain number of infants to survive to raise families of their own, no matter how many are born. A large birth rate results in a large death rate, so what is the use of large families, if the small families supply enough? Economists still

nurse the error which made the predictions of Malthus so doleful, and with less excuse. They have not yet grasped the universal biological law, that every species of plant or animal produces such a surplus that there is a struggle for existence, with a constant evolution through selection. The birth rate regulates itself and we need not bother our precious brains about it. It is always so large that about one-tenth of every human population is at or below the poverty line the world over, and we can not change the state of affairs a particle. The reduced death rate, renders the old prolificness unnecessary, but enough survive to continue the old struggle for existence which is today almost exactly where it was in the time of Malthus and back to the beginning of things. The only change is the higher standard of living needed, and that is and always has been rising and always will rise, necessitating a still lower birth rate in the future.

**Is It a Man's Social Duty to Raise a Family?**—The social organism was evolved to help men survive, and they cannot live without its assistance. Indeed it is so necessary, that men will sacrifice themselves in wars to preserve it in the form they think it should have. Every social organism takes a form necessary to preserve the



men composing it and not a form necessary for some future population, big or little. It is sheer nonsense to state that we must always increase these numbers to increase the organism's efficiency. We cannot create a form needed for the future because we do not know what the future will be. Our own government is nothing like what our forefathers devised. Nor can any man tell whether his posterity will be fit to survive. We can therefore state it as a biological axiom that it is no one's duty to supply offspring for an unknown future. If he does not wish his name perpetuated by those who might disgrace it, it is his own business. The eugenists also have an absurd fear that the low birth rate of certain "higher" classes is a disaster. Here too we need not worry over it in the least. What is known as the upper or intellectual class is always dying out and always being recruited by exceptional variations in mediocre families. Unquestionably we would like to keep in existence such types as our revolutionary leaders whose descendants are now entirely out of public life, and we will do it if we find out what ails them, but there is no use worrying over it. New families are taking their places. Besides all this, the type of mind necessary to succeed in this era, may have been a gross failure in the agricultural life of two centuries back. Each age gives opportunity to types which never had a chance before and thus creates new leading families—ancestors instead of descendants. So it is perhaps just as well that race suicide does afflict types fit for a past regime for they may be very undesirable later—malefactors of great wealth and what not. The eugenists are creating a lot of absurd worries. The world will find its leaders as it always has—in families where we least expect them.

**The cause of war** ought to be studied from this biological side, for surely there must be some understandable reasons for the persistence of this form of murder which has been denounced by philosophers for over 2,500 years.

Our peace conferences have not had any noticeable effect in diminishing even its severities. They have been as futile as though they had been held to discuss plague and yet did nothing to find the cause or remove it. They are in profound ignorance of the biologic foundation of the human species as well as of all other species of animals. It is time to realize that we are so constituted that we cannot help going to war, no matter how much we dislike doing it. There have been evils, such as slavery in our south, which could not have been eliminated any other way. Nothing but war could have ended the oppression of the American Colonies, nor will anything else end the Mohammedan persecution of Christians. Unfortunately the peace societies deliberately keep themselves in ignorance and will not listen to those who would tell them why war exists and why it can not be eliminated for a very long time. The literature put out by these well-meaning people is so full of misstatements as to reflect on their common sense, and yet their propaganda of ill founded and erroneous views is receiving the support of all the churches. Can much be hoped for from a movement based on such false and illogical premises?

**Why Do Organized Men Kill Each Other?**—They have been doing it ever since the creation of man and are now hard at it in Europe which has been a battle ground for at least a half million years and probably double that time. Malthus knew why, but

it has become so fashionable to sneer at that great thinker that discussions of war are positively unscientific. Biologists like David Starr Jordan will carefully teach their students that in every species an average of only two offspring can survive and yet state that in man survival is possible for all without fighting for it. History is merely a catalog of the expedients adopted for cooperation in forcible expansion at the expense of neighbors—expansion for survival. An English labor leader is reported to have said, "Malthus be damned, we'll have as many babies as we wish, and find food for them too." The English have multiplied so greatly that over half of their food is imported and now they must go to war to protect their supplies and avoid starvation. All nations prided themselves on their rabbit-like procreativeness, but suddenly realized that it resulted in emigration of the surplus which could not import food paid for by manufactures. Every nation's policy has therefore been for expansion to avoid emigration. The prize of survival goes to those who can take it. Every European statesman knows the evils of war and would end it if possible. They are probably the ablest men in the world, and if there was a way they would find it. It is sheer stupidity on our part to state that they could do it if they would.

**Will Wars Ever Cease?**—They have been getting less frequent since the time when every man slept on his sword in a perpetual war with neighbors ever ready to steal his wife and property. Formerly defeat meant slaughter, and even the victors lost half or more of their numbers. In time a smaller and smaller percentage of those engaged were killed and at present, wars are less deadly than ever. The ag-

gregates appall us, but the percentage of a nation which dies in war is a mere trifle compared with past times. It does not even equal the number below the poverty line. Men now surrender when further resistance is evidently useless, but did not dare to do this when all prisoners of war were put to the sword. Will the time ever come, when we will surrender before battle, if resistance is hopeless? If so the weak nations will be at the mercy of the strong. It is foolish to claim that reduction of armaments will lessen the chances of war. Men fought constantly when the only weapons were chipped flints, and wars have diminished with every increase of armament. They have diminished in only one way—by the amalgamation of competing neighbors into a union whose mutual interests demanded cooperation. This only resulted in fewer but bigger wars. Have not the sons of Noah overdone God's injunction to be fruitful and replenish the earth? Seventeen millions of them are now at each other's throats in Europe, and every little while twenty million die in the periodic famines of Asia. Men ignorant of biology still prate of the advantages of a big birth rate and the coincident elimination of war, famine and poverty, but not one sensible suggestion is made as to supplying enough food, raiment and shelter. We cannot feed the present populations; therefore, stripped of all its obscuring details, the present war is basically a struggle for bread. Statesmen are constantly occupied in means of increasing the food supply but the flood of babies increases the struggle for it. Let us stop denouncing war and find the reasons for it. Then if the nations of the world can remove these reasons or causes we can reasonably hope for permanent peace—but only then.

**The medical side of the present war** will be most interesting. For the last fifty or seventy-five years the dense populations of Europe have survived with small birth rates largely because they have devised elaborate ways of avoiding infection. Sewage disposal and water protection have become fine arts, but now all these precautions are being abandoned by seventeen million soldiers and an unknown number of civilians. The only closet facilities will be shallow pits in camp, and the drinking water will be anything in reach. In a short time all streams will be polluted and if methods of sterilization are not devised we may expect the usual horrors of dysentery and typhoid. The French and English have anticipated an impossibility of avoiding typhoid by sanitation and have ordered the vaccinal immunization of soldiers. We will now see whether it is practicable to do this, and if so, whether it is effective. The Germans have already tried it in an African campaign, and gave it up as not sufficiently valuable. They expect to avoid typhoid by sanitary precautions. The longer the war the greater the unavoidable pollutions and the greater the difficulties. The food supply is the greatest task. It is impossible to feed seventeen million men detached from the usual sources. Even one corps overtaxes the means of transportation. Only the bare necessities of life will be given and at times not even these. So we will see all the results of undernutrition and these will magnify the infections. They say that rapid fire guns can use up in a few engagements all the ammunition it has taken years to collect. A long war cannot be as fierce as its beginning, and in time disease will reap its harvest. Dysentery has ended many a campaign in Belgium and cholera is already at work in the Balkans. Small-

pox will not bother them except in the south. Americans have always campaigned in thinly settled country and must supply canvas shelters, but the Europeans depend upon such buildings as they can seize. At other places they sleep in the open with all the disasters of exposure.

The first effect of war is to increase the distress, but now the interference with farm work may not cause the usual post-bellum famines as food can be imported. It is our poor who will suffer from the outflow of our supplies. Besides, there will be fewer mouths to feed abroad. Indeed statesmen have recognized the blood letting as sometimes beneficial and have deliberately favored war so that the food would go around. Yet after it is all over the birth rate instantly rises to restore the old poverty and the international competition for food.

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**The surgical cure of early cancer** is such a well proved fact that we are considerably mystified at the manner in which the lay press has recently accepted the announcement as something new and contrary to the generally accepted theory of the profession. It seems therefore that the word cancer is still considered a sentence of death, at least by the few journalists responsible for the curious articles which have been appearing. Perhaps we ourselves are to blame for much of this popular ignorance and it would be just as well to undergo a little self examination to see if we have been remiss in any way. Most of us have unquestionably been persistent in advising cancer patients to submit to early operation before it is too late, but there seems to be widespread reluctance to undergo surgical treatment of any sort. People dread the knife now just as much as

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they did a generation or two ago when surgery of any sort was something of a gamble on account of the high mortality from sepsis. The word operation meant far more than now and the dread it inspired was justly earned. The first step in the direction of educating the public is to inculcate the idea that an operation of itself has not its former seriousness. Perhaps then we can induce patients to submit to early exploration when there is a suspicion of internal malignant disease. Cancer of the stomach has a dreadful mortality because diagnosis by ordinary clinical means is not certain until too late, but if exploration is permitted many a case could be cured. There is no reason to doubt that early excision results in permanent cure just as often as in any other situation, though of course we cannot accept published statistics at their face value because it is so difficult to keep track of discharged patients.

**The delay in finding the cause of cancer** is most discouraging, but perhaps some obscure country doctor like Jenner or Finlay will hit upon the proper correlation of the facts to be dug out by the research people. In the meantime the surgeon must be depended upon, and he will fail unless we get the patients to him early enough. As a side thought it might be well to find out whether it is possible to turn an inoperable cancer into a benign form like mouse-cancer which does not cause cachexia, but if unchecked in growth destroys through mechanical interference. We might check such growths even if we cannot cure them. The appalling mortality certainly warrants much more study than has been accorded the disease. Early diagnosis is now as great a need as to convince

the public of the necessity for early operation. So let the search for the cause occupy our laboratories with renewed enthusiasm. It is not too optimistic to state that the discovery of the cause is not far off, and we will then devise methods of cure. The disease is destined to be removed from the domain of surgery.

**Fish cancer** has again been brought to public notice by the report of Dr. H. H. Gaylord of Buffalo, Director of the State Institute for the Study of Malignant Diseases. After six years of investigation, he is firmly of the opinion that "gill disease," "thyroid tumor" or "endemic goitre" is cancer and the cause is a living germ. It is prevented by sterilizing the food, though he has never succeeded in transferring it from the diseased to the healthy either by inoculation or feeding the cancers to fish. It afflicts the hatchery fish to an alarming extent now and then. All this is most unsatisfactory, and justifies one in doubting that there is a living specific cause. At least, the proof is not conclusive enough to form an opinion one way or another, for there might be dietetic causes at work. Not a few pathologists have suggested the possibility that human cancer is metabolic in origin and as far as we know, they are firmly of the opinion now. It is rather disappointing that six years have not produced something conclusive. The State of New York has given many thousands of dollars to preserve trout fishing and we hope that it will square itself with Heaven by giving ten times more to find out the cause of cancer in mere men. Perhaps an entirely new line of endeavor might be tried, now that the old methods have so signally failed. To this end, nothing is too bizarre for investigation. We would have discovered

the transmission of yellow fever thirty-five years ago, if we had not considered Finlay a crazy nuisance with his mosquito theory.

**Sanatorium treatment for consumption** does not seem to be doing as much as we had hoped and it would not be surprising if the medical profession were to lose some of their enthusiasm. Mr. Arthur Hunter, Actuary of the New York Life Insurance Company, discusses the matter in the July number of the *Medical Review of Reviews*, taking as his text the investigation made by two English actuaries, Elberton and Perry, under the auspices of the University of London, as one of the studies of National Deterioration and published as the eighth of the Drapers' Company *Research Memoirs*. They used the histories of 3,000 patients treated at an Adirondack sanatorium. An attempt was made to compare these with 443 treated by Dr. Austin Flint from 1845 to 1870, but it was difficult on account of the difference in diagnostic methods. Modern cases include many which were not recognizable forty-four years ago. Hence Flint should have had a higher mortality and shorter average life. The investigators would only say—"We hope and think that some improvement has taken place, but it is far less than has sometimes been stated." Hunter came to the following conclusions:—

1. That it is most advantageous to the patients to have the case diagnosed in the early stages of the disease, and the proper treatment promptly begun;
2. That the mortality is at least three times as great among the advanced cases as among the incipient, the delay in treatment greatly lessening the chance of recovery;

3. That there has been an improvement in the mortality, but the figures for later years are small, and therefore should be accepted with caution;

4. That the relative mortality among women is lighter than among men in the incipient cases, and this is probably due to two causes:

- (a) that women are able to lead more protected lives;
- (b) that women are admitted on an average in the earlier stages of the disease.

On account of the great mortality in the far advanced cases, sanatoriums show a tendency to exclude them to make room for the curables.

**The incurability of latent tuberculosis** is the opinion which seems to be taking hold of the profession. Of course we cure an active process providing we see the case soon enough, but we only confine the bacilli to their strongholds where they sleep and never die. Every man thus carries his own executioner, for when he misbehaves physiologically or allows some other infection to reduce his defenses, the tubercle bacilli dash out to give the final blow. The longer we permit them out of their bounds, the less our chance of checking their headway. We are afraid that tuberculosis is merely one of Nature's way of killing off those who are unfit for their environment, and that in spite of all our preventive means they will be like the poor—with us always. Indeed, poverty is perhaps the chief cause of that lessened resistance which permits the latent lesions to spread, and as we have no way of ending poverty, we will probably never end consumption. All this sounds pessimistic, but it is only calling attention to facts to which the crusaders

seem blinded. The cloud has a silver lining nevertheless, and that is the increasing surety of checking the spread of lesions in those who can buy the means—air, rest and food, all of which are luxuries of the few rich and beyond the reach of the many poor. Formerly the rich had as little chance of recovery as the poor. The steady reduction of the tuberculosis death rate seems to mean that fewer allow latent lesions to become active, not that more active cases recover. Prevention is the shibboleth.

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**The enormous consumption of alcohol and caffeine in the United States** is again up for its annual comment. Repeated discussion of the subject is necessary in the interest of public health, if these drugs are as harmful as we generally believe. The *American Grocer* has recently called attention to the long known phenomenon of a steady increase in the *per capita* consumption of beer and spirits in spite of the gradual extension of prohibition territory. There is a grain of consolation in the slight decrease of the wine bill—but it is only a grain. The *per capita* consumption of all beverages in 1913 was 22.68 which by the way was exceeded in 1907 and 1911, thus giving rise to the suspicion that the temperance movement is really checking the tendency to inordinate use. Nevertheless the increasing number of abstainers indicates that the users have increased their daily potations to an estimated 89 gallons of which 91 percent is beer. The cost of all this is about seventeen dollars *per capita* which is increased to twenty by tea and coffee. The tax on the alcohol furnishes one-fourth of the national revenue exclu-

sive of postage stamps. What is to be the outcome of all this? Is the situation as bad as it is painted? The alleged diminution of drunkenness, the increase of public health, the steadily diminishing death rate, and a host of other good things, seem to indicate that the alcohol is being used by an increasing number of foreigners who rarely go to excess. We had the temerity to suggest last year that there might be a benefit in the very moderate use of alcohol. We have not been bombarded with any proofs that the audacious suggestion was wrong. Until the question is settled we need not lie awake at night worrying over the possible degeneration of the human race. When the decay is evident is the time to worry. The time for the indiscriminate condemnation of all sedatives and stimulants has long passed. Too many millions of people use them to old age with apparent benefit. We must form scientific opinions based on all the facts and not come to a conclusion from a study of a few drunkards. No one condemns a meat diet solely because a few gluttons kill themselves.

**The danger of the medical temperance movement** is the suppression of facts in favor of alcohol in sickness or health. The movement has assumed all the partisanship of a propaganda. Some years ago, a few British physicians announced that "as an article of diet, we hold to the universal belief of civilized mankind, that the moderate use of alcoholic beverages is for adults, usually beneficial and amply justified." A little later, the *Bulletin of the American Academy of Medicine* quoted the following from the *Journal of Inebriety* as "worth repeating"—"The medical man, of all others, should be a total abstainer. \* \* \* A

moderate and excessive drinking physician is a diseased man \* \* \* A physician who becomes intoxicated is an insane man." Such talk is injudicious to say the least. We ought to confine remarks to the one surely known fact, that alcohol is a depressant and that in minimum physiologic doses, it invariably injures the finer judgments and makes actions uncertain. Physicians surely ought to abstain, but they are not crazy if they refuse. Some employments must be limited to total abstainers. For instance, deaths have been caused by chauffeurs who have had "only" a drink or two and the time is now ripe for a law excluding drinkers from the calling. It may be true that a single drop of alcohol has no effect and also true that many drops may have no measurable effect, but every one has a limit at which the depressant action appears. No two men are alike in capacity and no one knows his own personal equation, so the part of wisdom is to leave it alone if our calling demands abstinence. Few observing physicians nowadays seem to think there is any harm to a tired middle aged or old man if he takes a sedative toddy at night after the day's work is over, and most authorities approve the habit. There is no use wasting time discussing the harm done by excess, except to say that the nervous cause of drunkenness is often considered the result. Where we must not dogmatize at present is the ultimate effect of long continued moderation, on health and longevity and the sum total and quality of one's life work, particularly if taken after the day's work is over. We know only enough to state that it is not as bad as fanatics say, or the human race would have died out long ago, and that the universality of the habit seems to point to some benefit. The only fact surely proved by life insur-

ance statistics is that in warm climates the total abstainers do not live as long as those who drink the wine of the country, but in cold climates the abstainers have the advantage. There has never been a satisfactory explanation of the paradox.

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**The reasons for the universal use of tobacco** ought to be discoverable but no one seems to know them. Dr. A. D. Bush (*New York Medical Jour.*, Mar. 14, 1914) has found that smoking in any form diminishes mental efficiency ten percent. Of course that means smoking to some considerable extent, for a puff or two has no measurable effect. There is ample reason to forbid workmen to smoke in working hours, as the employer pays for a maximum efficiency which is impossible of attainment without mental alertness. But the reduction of mental speed is exactly what the tired man needs after the work is over—and between times too. Studies of muscular fatigue have established the fact that work must be intermittent, and, moreover, after a certain number of contractions a period of absolute rest is needed before efficient work is again possible. Mental labor follows the same rule. Concentration can never be kept up long—only a few seconds in infants, a few minutes in childhood and a very few hours in adults. As a matter of fact brain workers unconsciously relax every few minutes, and consciously every hour or two. If they aid these periods of rest by the sedative action of tobacco the resting period is more effective and the later work decidedly better. There are men who can rest properly without being soothed by tobacco and have done grand work, but there is no telling how much

better they might have done if they had known how to use tobacco properly. The vast majority are not so built. The brain was evolved for the struggle for existence and is always under a strain because the environment is constantly changing and producing lack of adjustment. Tobacco gives a conscious relief to the higher centers or those last evolved, and for that reason is universally consumed. The same explanation has been given of the universal resort to alcohol. There is justification for the opinion that tobacco at least, and possibly alcohol too, really promote human efficiency by inducing earlier and longer rest and more complete recuperation. The young do not need tobacco, as they can recuperate without it, but a period comes sooner or later when mental processes refuse to slacken after the work is done and keep up part of the night, or all of it. Then we instinctively seek relief in tobacco. The deprivation of this aid is perhaps one of the causes of the neurasthenia often found in abstainers. We, as physicians, have been rather hypocritical in asserting that tobacco is invariably harmful and yet deriving pleasure, comfort and physical benefit from it ourselves.

**The abuse of tobacco** should not blind us to its benefits. When AMERICAN MEDICINE suggested, a few years ago, that smoking in moderation was harmless to adults, *Good Health* denied this universally recognized fact and in proof detailed the well known harm of excess, and incidentally some facts which were not facts. It seems safe to generalize that the less need there is for tobacco, the more harm it does. Youths can ease up mental pressure almost instantly and tobacco is liable to

prove an excitant rather than a depressant. Boys seem to be universally harmed, though the scientific details are lacking. In discussing the relative effects of cigarette, cigar, pipe or chewing, writers now refer solely to the harm. For over thirty years physicians have shown the cigarette to be the least harmful, cigar next and then the pipe and chewing tobacco. The crusade against the cigarette is sheer nonsense fostered by a few fanatics. One of them, by the way, has been detected publishing a letter of commendation he wrote to himself to make it appear to be a big movement. What we now need are some observations as to which form does the most good in moderation. "The exact physiological and pathological consequences of drinking and smoking are among the most obscure problems of medical science," (*New York Medical Journal*, July 25, 1914) so it is high time to end the flood of ignorant, fanatical denunciations of both drugs, and set ourselves the task of discovering why practically all mankind uses them—and a heap of womankind too. We instinctively trust the quiet man soothed into a judicial attitude by his pipe, and avoid one whose nervousness is due to abstinence or excess. We do not deny the use of automobiles because a few kill some men, so why should we deny all benefit to tobacco if it should kill about one in fifty million users. We must remember that the vociferous abstainers from one drug are often drunkards in the use of another, for the need of something is inground in our nature as a result of the rapidity of the evolution of civilized environment with which our own physical evolution cannot keep pace. What constitutes excess depends on one's personal equation, but may be far less in all these drugs than the profession thinks.

**The high death rates of the Irish in America** were described in the *Bulletin of the Boston Health Department*, May, 1912. Subsequent investigations of the New York City Health Department have shown that the conditions are much more alarming than was thought possible. The Boston statistics include all those whose mothers were born in Ireland while the New York rates are calculated separately for those born of Irish parents in Ireland or America. As these two classes do not differ materially it is safe to conclude that those unfit to survive here are not eliminated at once, and that many of the native born of the first generation are hereditarily at a disadvantage. According to the twelfth census the death rates for all over 15 years of age in the registration area are higher for those having Irish born mothers than for any other division of the white population. The phenomenon then is nation wide and though it may be more marked in the cities, we cannot blame city life exclusively. The cause is present everywhere and it certainly behooves medical men and anthropologists to bestir themselves to find it, for at the rate the Irish are dying it is only a question of time when certain types of them—the big and blond—will be eliminated from the population except where kept alive by infusion of more resistant blood. The small, dark types seem to do well. Tuberculosis is responsible for much of the excess mortality. In Boston in 1900, it accounted for 70 percent of the excess from the ages of 15 to 19, though this percentage progressively lessens with age as in other races. In New York in 1906 the Irish death rate from pulmonary tuberculosis was 476 per 100,000—almost exactly double the rate for the whole city. In Boston the other causes of excess deaths

were pneumonia, heart disease, nephritis, cancer, apoplexy and alcoholism. Dr. Austin O'Malley of Philadelphia some years ago investigated a large number of Irish families to the second and third generation in Pennsylvania and reported an appalling number of cases of alcoholism, and in Boston, in 1900, there were 68 deaths from alcoholism of whom 44 had Irish born mothers. Since alcoholism is invariably an expression of a profound alteration of the nervous system and is not a marked phenomenon in Ireland, we are justified in concluding that something in the nature of exhaustion is at the basis of the high death-rates of the Irish in America.

**The law of adaptation to environment** could not be better illustrated than by the different death rates of the various races in America—particularly the Irish. Moreover, the statistics in New York City from 1906 to 1912 show that in spite of some variations certain nationalities always have high death rates from tuberculosis and others low rates, and as this disease has been proved to be the bane of migrants in an unfit environment, it can be taken as an index of unfitness. It has well nigh eliminated some Scandinavian colonies in the vicinity of Chicago, and the Lithuanians in that city simply melt away from it. If we interpret Hippocrates correctly it wiped out the blond Homeric Greeks. As climate is the chief factor of the environment we must expect that a great change will be disastrous. It has long been known that a small lesion which will not be a menace to one in his proper climate will promptly kill a white man who goes to the tropics. Ireland has no extremes of heat or cold and is never cursed by excessive light. It has developed remarkable sub-types from the

numerous pre-historic and historic invading races which have settled there. These men are perfectly fitted for the environment and when properly fed are a fine lot physically and mentally who are really the back bone of the defenses of the British Empire. But when they migrate, deterioration is sure to result to those least fit to stand the excessive cold, or heat or light of America, and the first generation native born shows it worse, as their death rate is still high in spite of the elimination of the least fit of the immigrant generation. At the opposite extreme in New York City are the natives of Germany, Russia and Poland who have the lowest tuberculosis rates. They are largely Hebrews adjusted to city life through a cruel selection for centuries. They can thrive in an indoor life which would promptly kill races which have not been adjusted to it in the past. Our well-to-do classes who can escape to the suburbs are largely from Germany, British America, England and Scandinavia and they all have low rates, but the blond Scotch have nearly as high rates as the blond Irish. The Swiss, Bohemians and Austria-Hungarians have rather high rates as always happens to highlanders who drift to the lowlands of hotter countries.

**The ethnic results of racial death rates in America** are matters of grave concern, for we are losing splendid mental types which might be preserved if we knew how. The process has probably had much to do with the gradual transfer of public affairs from the old colonial stock to those who have immigrated since the revolution. Our ancestors were healthy and raised large, healthy families when they lived in cold, draughty log houses with open fire-places but when they became prosperous and built

badly ventilated, overheated houses, tuberculosis began its ravages. It has not made the type fit for its environment outside of the slums. The process is so rapid that in New York City, the native born had a tuberculosis rate of only 175 from 1910 to 1912, and still less among those who had native born parents. This process has taken from the colonial stock the blondest who, as a class, were largely responsible for our early history. It is destined to destroy the best of the new stocks as it is now doing with the Irish, whose numbers decreased by 22,500 in New York City between 1900 and 1910. There are ugly rumors of the tuberculosis appearing among Americans native to our great plains. That is, the fittest survivors of the eastern seaboard are proving more or less unfit for the hot, dry, sunny plateaus. We might have known that a climate which evolved the Zuni type of man would not tolerate one fit for Norwegian fiords.

**The anthropology of vital statistics** must be taken up by our health departments and life insurance companies. So far they have told us that certain nationalities in America have higher rates than others. This is not enough. Each European nation is composed of the same types in different proportions. There are Nordic types in Italy and Mediterranean in Scandinavia. We must know what types among the Irish for instance, are being wiped out with tuberculosis, alcoholism and other disasters. European investigators are doing this, but we who have vastly better material in our more diversified population are doing nothing. There should be an anthropologist in every statistical office, for his work at last has a very practical value in therapy and preventive medi-

cine. He is no longer a delightfully impractical old gentleman, among dry bones in a museum, but is dealing with flesh and blood, keeping them pure and vigorous.

health authorities of big cities, but there is evidently much more to be done in the little towns and cross-roads hotels. Travellers must beware of raw foods in particular.

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**The new bacillus hypertoxicus** which is said to have been isolated by Rappin of the Nantes Pasteur Institute last fall, is of special interest to Americans because of the frequency of severe or fatal cases of food poisoning. It seems that some dozens of wedding guests died after the supper and that a new bacillus was found in the cream eaten. It was subsequently recovered from the victims and proved very fatal to guinea pigs. As it seemed to differ from all other known bacteria, though apparently allied to the paratyphoids, and as its pathology was unique, it was considered a new species. There is room to doubt this conclusion, and we may expect later reports to place it with the colon groups. Every now and then we read of just such cases on this side of the ocean, but rarely has a large quantity of food been so greatly infected as to cause many fatalities at once. There is no reasonable doubt that the same or a similar organism is the cause. We formerly thought that all these cases were due solely to the toxins produced by pure saprophytes as in the case of sterilized decayed canned meat, but in late years the impression has been growing that the organisms also produce toxins after entrance into the alimentary canal. Rappin now reports that this bacillus was recovered from the blood as well as the excretions. We must then extend our view point as to food poisoning. The lesson to be derived from these cases, is the necessity for a renewal of the warfare against filthy farms and restaurants. We have frequently mentioned the great reforms already accomplished by

**The evolution of new species of bacteria** was touched upon by Dr. F. A. Andrews, in his Presidential Address to the Pathological Section of the Royal Society of Medicine (*Lancet*, Nov. 1, 1913). He is not at all sure that we are correct in our present day classification. He suspects that though the *genera* are so far separated from each other that one can not change into another, yet within the *genera* the species are in a sort of melting pot from which new species are in the process of evolution. He would not hesitate to declare paratyphoid and typhoid to be separate species, or even separate *subgenera*, yet there are paradoxical cases where typhoid sera agglutinate paratyphoid and not the homologous group, and vice versa. He therefore warns against using serum tests to differentiate species. The point one gathers from his remarks, is that non-pathogenic organisms might become virulently pathogenic through the action of the unusual food and environment, as in the reverse process of losing all pathogenic power in the laboratory. This is not the creation of permanent species, as they revert upon restoration of the usual environment. We must be wary then as to the discovery of new species, as so many alleged ones have proved to be merely temporary modifications of others. Thus again we are made uncertain as to our diagnoses—perhaps some of our paratyphoids are really typhoids after all. Bacteria vary so rapidly and so widely that we must revise many of our old ideas. Hypertoxicus may then be a mere temporary variety of a harmless one.



## MEN AND THINGS



**Times of business uncertainty and economic disturbance** such as this country, though far removed from "the theatre of conflict" as the correspondents say, is just now undergoing, serve to bring out in a very definite way the actual principles that underlie the business policies of men and firms. As long as conditions are normal, custom and usage prevent any divergence from established methods of business comity. But let anything arise to confuse the situation or disturb ordinary relations, and straightway the occasion is seized to adopt a course of action that would make a Balkan brigand feel like an amateur or a pirate of the Barbary Coast blush with shame. Happily, firms who take advantage of a time of trouble and misfortune to advance their prices, or deceive their patrons in any way, are few and far between. Most business houses realize that such tactics are more liable to harm themselves than any one else. It is a matter for special congratulation that the drug and pharmaceutical industry has so few firms who have shown the buccaneer spirit during the present deranged condition of the drug market. A few concerns, to be sure, have disclosed "the cloven hoof," but the great majority, sensible of their obligations and alive to their responsibilities, have pursued "the even tenor of their way" and assured their patrons that regular prices would be maintained even on goods of which only a limited supply was on hand and available. In thus proving their unwillingness to trade on misfortune and the needs of afflicted humanity, they deserve the respect and commendation of every decent person. The optimist is bound to find much to strengthen his confidence in mankind in the splendid way that our leading purveyors of medical and surgical supplies have refused to take advantage of the pres-

ent situation of world wide disaster to make a few extra dollars.

Not a few firms as soon as the war clouds threatened took instant steps to secure extra supplies of the raw materials used in their manufactures. The good business judgment that thus protected their costs and made any change in the selling price unnecessary is as commendable in a way as the integrity that refused to increase the price on imported goods because of temporary uncertainty as to the quantities to be had in the future. Of course, it is recognized that in a few instances costs of certain products have increased as a result of conditions for which no one is responsible. Under such circumstances, it would be most unfair to condemn the legitimate increase in the selling price of the completed article. No firm can be expected to suffer losses for which it is in no wise to blame. Fortunately the present difficulty has affected costs to only a slight degree, up to the present time.

Among the conditions that have arisen during the past month, however, there have been many that the firms who have refused to raise their prices, might have taken as legitimate excuses for having done so. That they have kept faith with their patrons, in spite of such good and substantial reasons for pursuing a different course, only emphasizes their integrity and honor.

We wish to take the moment, therefore, to express our hearty appreciation and respect for the firms who have steadfastly refused to capitalize the present situation. It is a time for the exercise of all possible skill in conserving every interest, protecting every cost and trusting to the reasonable certainty that the working out of economic laws will sooner or later bring relief. Those firms who during this crisis have shown that honor and decency are not the least of their assets may be very sure that they have de-

veloped a surplus of respect and esteem that will not fail to prove its value as the months go on.

**No apology is necessary** for printing in this issue for the delectation of our readers the delightfully humorous skits presented by Dr. W. M. Brickner at the recent banquet of the American Medical Editors' Association in Atlantic City. It takes a high order of literary talent and ability to write a successful parody. Dr. Brickner has shown on many occasions that he possesses this talent and ability, but never more successfully than in these remarkably clever paraphrases of the well known character stories by Montague Glass and Peter F. Dunne. It was with much reluctance that Dr. Brickner consented to allow us to print these sketches, for there was more or less doubt in his mind as to the propriety of publishing humorous articles of this character in a publication devoted to scientific medicine. We were able to show Dr. Brickner, however, that in our efforts to make AMERICAN MEDICINE interesting as well as useful to medical men, we have not hesitated to publish much material that was quite removed from the realm of medicine or surgery, material in other words, that has appealed to the human rather to the purely professional side of our readers' lives. That we have sacrificed no part of the dignity and standing of AMERICAN MEDICINE as a scientific publication of earnest purpose and effort, we feel certain, not only from our constantly growing subscription list, which for a long time has placed us second to few other medical journals in this country, but also from the many letters of appreciation and approval we are receiving every day from the leading physicians of our land.

Therefore, we could assure Dr. Brickner that his stories were not only adapted to the aims and policies of AMERICAN MEDICINE but that he would make no mistake in giving them to the medical profession through the pages of this publication. The delicate note of irony and good natured satire which permeates these stories and touches more than one of the foibles of certain types of physicians will be enjoyed by all who read them. With these few comments we leave Dr. Brickner's amusing contributions to our

readers confident that they will find them as delightful as did those who heard them at the Editors' banquet.

**The Psychic State of the Surgical Patient.**—There is an interesting fact concerning the psychic state of the patient at the time of the operation says Geo. W. Crile, in *The Southern Medical Journal*. If the patient is in grave doubt as to whether or not he can survive the operation; if he lacks confidence in the hospital or in the surgeon, the patient has what in psychology is known as a low threshold, and if he goes under the anesthetic in this state, the effect of any physical injury will be augmented, and throughout the entire anesthesia there is manifested the evidence of fear in the respiration and the pulse, and in the way in which he reacts to the anesthetic and the trauma of the operation. These patients take the operation poorly. It is as though the patient went under the operation with his motor set at high speed, so that the energy of the body is consumed more rapidly, and hence the exhaustion or shock is increased.

**A Litany.**—From lectures on sex hygiene, from the fellow who calls you "Doc," from the patient who wants "something to relieve her condition," from the patient who wants free advice over the telephone, from book agents and drug vendors, from the average paper read at our medical societies, from the doctor just out of college, who is "just as busy as he can be," from the patient who has been trying prescriptions recommended by his friends, from hysterical females, from curbstone consultations, from Chiropractors, Christian Scientists and Chinese doctors, from the doctor who has just performed a very "interesting operation," from the doctor who prefaces his remarks by "when I was in Europe," from the doctor who asserts "there are just three drugs that are any good," from mining stock, oil wells and rubber plantations, from punctured tires and night calls, from the "tango" and other modern dances, good Lord, deliver us.—*Medical Sentinel.* Digitized by Google



## WHO WILL DISCOVER THE CAUSES OF THE INSANITY OF YOUTH?

BY

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"The excellent qualities of the mind, the most valuable and pleasing possession in the world, we see destroyed by poisonous drugs and by the violence of some disease."

Plutarch's *Life of Solon*.

The most dreadful misfortune, by all odds, which can possibly befall the young is insanity. It presents at once all the horrors which have been conceived of by early people and recorded in their legends, in their myths and in their religious traditions. Death itself, no matter how tragic, is a thousand times preferable to the insanity of youth. Death terminates life and suffering instantly, while the insanity of youth brings both to the sufferer and the family, a constantly repeated series of horrors, agonies, bitternesses, and distractions of soul that can never be measured in the units of the most sudden death.

The finest boy or girl in the family begins to act queerly—is filled with distress and doubt, suddenly shows a suicidal mania or a murderous frenzy. After all possible delays the astounded family can interpose against the physician's advice, the patient is reluctantly committed by judge and jury to a state hospital, to which the unfortunate parents and relatives look anxiously for the report of improvement which never comes.

At first, the stricken family are so overcome with distress and grief that they are callous to the conduct of the external world. Very soon, however, they discover that a change is wrought by this family grief. They are avoided by their former friends, and they realize bitterly that these friends never mention the name of the victim of the disaster or utter any word of sympathy, give any bit of consolation, or even refer to the calamity that has befallen them. Such is the public's misconception of insanity.

Although perfectly cognizant of all that is going on, the victim of the dread disease, shut up in an asylum that makes no pretense to cure, placed there not for his own good but for the good, safety, and complacency of those not yet afflicted, receives from old friends and schoolmates no word, visit or token designed to soften the bitterness and agony of his incarceration and the legal separation from his home, his family and his friends.

There are many ways in which the insanity of youth comes on. Frequently, the boy disappears from school and turns up again after a few weeks or a few days without a word of apology and without showing the least feeling of regret for his unaccountable misconduct. But this event is only the beginning of a recurring delinquency, that ends at last in frenzy and legal commitment. In another instance, the family, the schoolmates and the neigh-

borhood are scandalized at the discovery that the most popular boy in the high school is a convicted housebreaker, a petty thief, or a systematic robber. In any case, the end is the same, a progressive loss of physical strength and mental power, and at last the condition known as dementia precox—the loss of mind in early life.

The members of the victim's family also neglect the insane youth; not on account of lack of affection, but because of the false notion of the disease which possesses them. They are ashamed of their lunatic brother, their crazy sister or their insane child, while they go into nauseating sentiments over a consumptive servant or talk for hours about the disgusting symptoms of tonsilitis or of typhoid fever. A dental student, the son of wealthy parents, was put in a state institution while still a minor, and has not been taken back home or once been visited by a member of his family since that time. He lies, at twenty-six, a human skeleton, curled up in a bed, often filthy, for hours at a time, dressed in ill-smelling night robes, inadequately and irregularly fed, abandoned by doctors, and reluctantly cared for by nurses who are untrained in ordinary hospital decency and paid a shameful pittance of \$20 a month, for a service requiring the highest mental, moral and intellectual equipment.

#### THE MAGNITUDE OF THE PROBLEM.

The insanity of youth is a social problem of astounding magnitude and one calculated to arouse the attention of every educator, because the victims are of school age, of every statesman, because of the inroads it makes upon productive citizens; and of every parent, because his child may be the next. Our latest official information shows that, with a population of 90,691,354

in 1910, there were no less than 187,454 insane persons in the custody of the 372 public asylums of the United States. Of this number, 60,603 were committed during the census year; and of the total number committed, we have reason to believe, not less than twenty-five percent, or 15,150, were cases of youthful insanity. It must not be supposed that this number includes all the insane persons in the country. A very large number are kept at home and are never committed. Another portion, mostly in the families of the rich, are placed in private asylums and do not appear in the figures for public institutions.<sup>1</sup>

Because youthful insanity is incurable, and because the death rate from this disease, after the first year, is not high, patients in this condition make up more than sixty percent of the population of the public insane asylums. They greatly predominate also in the poorhouses in which the insane are herded in some belated states. More than 15,000 young people, coming from every class of society, and ranging in age from nineteen to twenty-six years, are annually committed with a lifelong sentence to the 372 public madhouses in the continental United States. It is difficult to conceive of fifteen regiments of doomed youths, but it is about one-eighth of the number that graduated from the 1,075 public high schools of the United States the same census year; and it is equal to the total enrollment in all the grades in the public schools of Cambridge, Mass., of Birmingham, Ala., or of Spokane, Wash. It is one-fourth the total muster of the United States Navy. Fifteen thousand insane youths each year exceed the number of

<sup>1</sup> Insane in Institutions. Preliminary Summary issued by the Census Bureau, Dec. 27, 1911.

deaths in the whole continent from the combined ravages of yellow fever, smallpox and cholera, and it is nearly one-half the number that die of typhoid fever annually in the northern United States.

#### THE FATE OF THE YOUTHFUL INSANE.

The insanity of youth is practically hopeless of recovery. In the state of Massachusetts, in 1911, only one recovery out of each 1,500 cases of dementia precox, or youthful insanity, that had been confined for seven years or less. It is difficult to discover, from the reports of other states, what proportion of recoveries have taken place, but it is certain that the rate is extremely small. It is an incurable and hopeless condition or a progressive and fatal disease.<sup>1</sup>

The death rate from dementia precox during the first year of commitment is apparently very high, but statistics are not complete on this point. In the hospitals for the insane in the Province of Ontario, the death rate among the youthful insane during the first year after commitment was almost twenty-five percent of the total admissions with this diagnosis the same year.

While few patients ever recover from this terrible disease, the sickness seems to rest at times, and the greatly clouded intellect and decrepit body go on living a routine life in the asylum until a new explosion of the disease further destroys the body and confuses the mind. The dull, silent herds of working inmates about every asylum

<sup>1</sup>The terms applied to insanity and all the surroundings of the insane change with the theories of the day. It is no uncommon thing to read in the literature of the past century of madhouses, lunatic asylums and crazy doctors or mad doctors. In the ten years past our asylums have become hospitals and the lunatic has disappeared, while some psychiatrists now object to the use of the words "insanity" and "disease!"

are largely dementia precox patients who are in a resting stage of the disease.

#### THE CAUSES OF YOUTHFUL INSANITY.

The causes of the insanity of youth are absolutely unknown. In ancient times, the young person was said to be possessed of a devil, and in the early days of New England such persons were frequently tried for witchcraft by ecclesiastic courts and either burned at the stake or punished in some other cruel and barbarous manner. As the knowledge of insanity increased, many of the keepers of the insane thought that the disease was due to religious excitement at revival meetings, to disappointment in love affairs, or to misfortune in business. Now there is quite a large group of men who think that the insanity of the young is due to a "twisted idea," to some suppressed sexual ideas, or to an hereditary taint. In some asylums today "adverse conditions," "mental strain," and "overwork" are set down as the causes of this form of insanity. In a sense, perhaps, they are. As a matter of fact, we have discovered no definite underlying physical cause of the disease and no cause adequate to explain its symptoms and course.

As we see from statistics in Massachusetts and elsewhere, the disease which is the basis of the insanity of youth is progressive, destructive, and eventually fatal. Patients live on the average only ten years and then they die, either of the disease itself or of the disorders incident to confinement in the institutions for the insane. At first, the patient is usually sleepless, maniacal, boisterous, and disturbed; but, either as a result of drugs or as a result of the natural course of the disease, the patient becomes quiet, inactive and is unable to walk about voluntarily, to feed himself, to utter a word,

or to escape an obvious danger. He becomes untidy in his habits, being unable either to make known his wants or to satisfy them decently. The muscles of the body often take on continuous rigidity, persisting even in sleep, and although an arm or a leg can be raised to an ordinary position, it stays for hours at a time where it is put and shows no tendency to come back into place. When completely exhausted, the extremity falls slowly into a more restful position, but one which is distinctly abnormal and characteristic of the disease. The teeth undergo a peculiar and usually rapid decay. The skin shows peculiar changes in its secretion and appearance, and the digestion is vitiated, disturbed, and at last inadequate to support life. Intercurrent or institutional disease comes on, and the patient dies in the end of exhaustion, of tuberculosis, of pellagra, of beriberi, or rarely, of some acute infectious disease.

As we have seen, a few cases do get well, at least partially and temporarily. It has been known for a long time that when erysipelas, from a slight scratch or injury to the nose or mouth, attacks a case of youthful insanity; and the temperature becomes very high, the patient, strangely enough, becomes lucid and begins to converse, sometimes after years of silence. The same phenomenon appears at the height of smallpox, of typhoid fever and even of Asiatic cholera. This lucidity usually lasts only a short time, but long enough to emphasize the fact that the mind of the youthful insane and his memory remain intact within the otherwise incomunicable dungeon in which the disease imprisons the soul, and that he is terrified at his condition and conscious of every attention and every neglect of others and of every unreasonable

and rash act on his own part.

The present methods of pathologic study have not shown any uniform or characteristic change in the elements of brain or body after death.

There are many reasons to believe that youthful insanity is but a symptom of an obscure and persistent disease, which is of a toxic nature and is probably due to some form of glandular derangement, like exophthalmic goitre, to an infection similar to the unknown infection of pellagra, or to an error of metabolism similar to that of beri-beri.

Only a short time ago, it was shown by French surgeons in Africa that the symptoms of dementia precox are similar to those of sleeping sickness and of other diseases produced by the spirochetes of other tropical maladies.

During the year 1912, and subsequently,<sup>1</sup> the methods of detecting the defensive ferments have been perfected by Emil Abderhalden of Halle, A. S., and these methods have been applied to the study of mental disease by Fauser of Stuttgart and Wegerer of Jena, as well as by a large number of investigators in other European laboratories. These investigations confirm our previous opinion that dementia precox is a malignant toxemia uniformly destroying the sexual glands and leading to a disturbed function of all the other glands of internal secretion. The brain is only incidentally affected and holds out much longer in its integrity than some of the other organs of the body. It is very likely that when the true cause of the dementia precox of psychiatry has been discovered the internal

<sup>1</sup> Abderhalden, Emil: *Abwehrfermente das Auftreten blutfremder Substrate und Fermente im tierischen Organismus unter experimentellen physiologischen und pathologischen Bedingungen.* Berlin, 1914, pp. XXIII and 404. Bibliography. Digitized by Google

medicine man will give it a rational and distinctive etiological and pathological name under which the present psychiatric group will occupy only a subordinate position in a greater syndrome of pluroglandular dysfunctions. By the use of this reaction of Abderhalden, research into the cause or causes of dementia precox is likely to be greatly assisted and guided.

#### THE TREATMENT OF THE YOUTHFUL INSANE.

If one asks today, what can be done for the insane youth? we must bow our heads and answer, "Not a thing." When the diagnosis is made, so far as medicine is concerned, the patient is irrevocably lost. Our science, having no knowledge of the natural history of the disease, offers no help. The institutions for the insane report, after seven years of custody, only one recovery out of each 1,500 admissions. If we are asked, What can be done to prevent the disease? we must assert with equal humility our absolute helplessness. Since the causes of this disease are entirely unknown, we have no measures by which the influence of any one of them may be modified. This is a pitiable condition of ignorance on the part of our science, and this condition is due to the fact that no adequate researches have been made into the physical conditions of the insane, and no concerted and proportionate effort has ever been undertaken to discover the causes of insanity.

Toward the close of 1912, Halvar Lundvall published his first report on the use of the nucleate of soda in the production of a hyperleucocytosis for the treatment of dementia precox. He secured great improvement in most cases of dementia precox and absolute recovery in more than twenty percent of the patients under his care by keep-

ing the leucocytes above 15,000. This remedy should not be neglected and it should be combined with all other means of promoting hyperleucocytosis and increasing the excretory power of the skin and mucous membranes.<sup>1</sup>

The remedy consists of the following material, and can be furnished by Mr. L. Brickwoldt of Sargent's drug store, 23 N. Wabash Ave., Chicago, or by any pharmacist having the ingredients.

Quassini depurati siccii .....	Gm. 2.0
Aqua destillatae .....	Cc. 50.0
Boil in a water-bath for one and a half hours,	
filter, and add	
Hetoli (i. e. sodii cinnamati) .Gm. 1.0	
Sodii nucleinati .....	Gm. 10.0
Acidi arsenosi (in solution) ..Gm. 0.005	
Boil until all is dissolved, filter, and add	
Aqua destillatae bullientis, q. s.	
ut flat .....	Cc. 50.0

This remedy keeps perfectly. It does not produce abscesses or much pain. It raises the leucocytes from 8,000 to 25,000 within three hours when injected in 2 to 20 ccm. into the subcutaneous tissues.

#### THE KNOWN CAUSES OF OTHER INSANITIES.

By a happy coincidence of abundant subjects for clinical observation, and skilful laboratory investigation of a common disease the cause of general paresis (often called "softening of the brain") has been recently discovered. This disease affects adults at the age of thirty-five to fifty,<sup>2</sup> and it is now known to be the result of an early, untreated, syphilitic infection. It affects only about ten percent of patients who are committed to public institutions for the insane, and these persons form a small percent of the asylum population, because the duration of the disease is fortunately very brief. It terminates in a horrid death after two

<sup>1</sup> Holmes, Bayard. The diagnosis and treatment of dementia precox. *American Journal of Clinical Medicine*, May, 1914, pp. 396-400.

<sup>2</sup> Median Age at Death, 1909, 48.2. Mortality Statistics, 1909, p. 27.

or three years of the most sickening decline. It rarely affects children and youths who have inherited or early acquired the infection, and it does not often affect persons over fifty years of age. Men are the usual victims.

The only other group of insanities of which there is any certain pathologic knowledge is termed alcoholic insanities. These diseases affect those who use alcohol, either moderately or to excess, and although they are occasionally fatal, their general course is slow and leaves a crippled mind and sometimes a partially paralyzed body. The patients live a long time in the institution or they are ultimately able to return, sad wrecks of their former selves, to the care of their families and friends.

There is abundant reason to believe that we are on the verge of discovering the causes of the insanity of mothers, and when we do there is equally good reason to believe that the discovery will be followed promptly by an efficient remedy and adequate means for prevention of this pitiable condition.

The old become insane as one of the symptoms of the degeneration of age, and we have many reasons to think, from reading the medical literature on the subject, that this unfortunate attendant on old age can be prevented as soon as the source of the particular poison, now known to exist and believed to cause the mental aberration, has been discovered by successful research.

Thus we see that the explanation of the mental disturbance in these insanities is just as clear as are the mechanics of the delirium of typhoid, pneumonia or erysipelas.

There still remains the most numerous, the most pitiable, and the most hopeless

group—the youthful insane—of the causes of whose misfortune we are entirely ignorant. The insanity of youth is not a crime or a vice; it is a disease and a misfortune. Before any rational study of this insanity is possible in the laboratories of psychiatry and in the medical service of the juvenile courts and the public schools, it is necessary that public opinion become thoroughly aroused to its prevalence, and the public mind turned from believing insanity a disgrace, and of a disgraceful origin, to conceding it due to a bodily malady, and a malady demanding study, susceptible of explanation and amenable to cure and prevention. We cannot admit that we are so hide bound that it will be necessary to await a new and unprejudiced generation of physicians before this promising work can be carried out.

#### HOW CAUSES OF DISEASE HAVE BEEN DISCOVERED.

In the past, most discoveries of the causes of disease have been made by physicians or by scientists working single-handed and alone—working without the support and encouragement of the medical profession and without a demand for succor on the part of the sufferers of the disease, or on the part of the public at large. Indeed, many of the greatest discoveries in medicine have been made in spite of organized opposition, unanswerable prejudices and legal obstructions. Harvey demonstrated the circulation of the blood single-handed, but he was unable to publish his discovery in England on account of unfriendly surroundings in his profession and the risk to his publishers of legal prosecution. Edward Jenner demonstrated the protection of vaccination in a storm of opposition, which has not entirely cleared away. Under the greatest difficulties of

private practice, Lister applied the anti-septic method in surgery and made surgical operations free from dangers which formerly followed them. He actually exterminated, by this antiseptic method, the pus disease, erysipelas, and hospital gangrene, and he increased thereby the capacity of the hospitals of the world more than fourfold, in shortening the stay of each surgical patient in the hospital. Under the most straightened circumstances, almost in poverty, and as a village doctor in a little mountain town, Robert Koch discovered and demonstrated to the world the cause of tuberculosis, of scrofula, and of the "white swellings" of joints. It was only a year later, however, that he was recognized in the highest medical circles and there was placed at his disposal the equipment of an imperial expedition into Egypt, where he discovered the cause of cholera to be the cholera bacillus. The riddle of typhoid fever, that of diphtheria and that of many other of the minor diseases, was solved in the same way by private initiative, by isolated research or by pure accident.

The sleeping sickness and yellow fever, however, defied the attacks of unsupported adventure, but they yielded quickly to organized research, and the Spanish-American war offers this one redeeming incident to the credit of the medical staff. With the cooperation and support of Gen. Wood, Drs. Reed, Carroll, Agramonte and Lazear and several volunteer soldiers demonstrated irrefutably the natural history of the parasite which is the essential cause of yellow fever. The Canal Zone has been made the field of the first great experiment in scientific public hygiene against yellow fever, and the theory of Findley—for the scientific demonstration of which Lazear and

Carroll gave their lives—was established and practically worked out.

So we might continue and point out how one after another confused mass of symptoms, looked upon with dread and mystical terror, have been shown to be the result of natural causes and subject to rational means of prevention or safe methods of cure.

Is there any reason to think the causes of the insanities, one of which has already been cleared up by research, are of a mysterious and intangible, unapproachable origin?

#### DISEASES OF UNKNOWN ORIGIN ON WHICH RESEARCH IS STILL GOING ON.

During the last ten years business interests and civilized governments have become desperately interested in the tropics. It has become an axiom with them that the mysterious diseases of the tropics must be studied and their causes discovered and means of prevention established as a preliminary to occupation for the purposes of business and civilization. The English in the Soudan have the Wellcome Laboratory at Khartoum, with all its accessories of a house boat laboratory and sanitary village equipment. In the Philippines the United States Colonial Government has established the Department of Science, which publishes frequently valuable studies. The continental European nations with African colonies are equally alive to the necessity of conquering the tropical diseases. As a result, we now value at his true worth the insect as a disease carrier and have discovered a great multitude of parasites of the warm-blooded animals that must pass through the body of some tick, some particular fly, or some other insect in order to multiply. Man shares with other animals the danger of inconvenience of the insect and the parasite

the insect carries from one to another.

There are many diseases met with every day by physicians in large clinics of which it is easy to say they will progress in a certain manner and end in a known way, although these diseases are still of unknown origin. Pernicious anemia is one of these. It can be recognized early by the examination of a drop of blood. It cannot be modified or averted. It is of unknown origin and cannot be anticipated or prevented. Arthritis deformans is another such disease. All of these conditions are extremely rare, yet the medical profession is making strenuous efforts to unravel them. Harvard University has recently sent an expedition to Peru to study the mountain fevers. The Rockefeller Institute has completed its study of epidemic cerebro spinal meningitis.

#### WHY RESEARCH ON INSANITY IS NEGLECTED.

The physicians who have attacked the problem of insanity have been obliged to do so almost unaided. They have found the clinical and laboratory equipment and methods so successful in erysipelas, tuberculosis, typhoid fever, malaria, and even in the sleeping sickness and yellow fever, wholly inadequate to make clear the infinitely more intricate problems of insanity. The overpowering symptom of mental aberration has brought together the insane of all sorts and kinds under the care of the State and into the legal custody of the asylums. The asylums are prisons as well as hospitals. These institutions, through false conceptions of the vicinal requirements of the disease, or through the exigencies of the spoils system, are located, for the most part, far from state laboratories, universities and libraries. These surroundings have been disheartening to students and unfavorable to research. The

ancient curse of political control and ill-advised restrictions of civil service have been added to the depressing mental atmosphere of a large population of crazy people, cared for by a floating population of irresponsible attendants and political time-servers. The institutions for the insane have been, and in a measure still are, notoriously abandoned to political spoil and commercial jobbery. The tenure of service for physicians has been uncertain, or certain only to terminate unexpectedly. Under such unstable circumstances, it is no wonder that the necessary persistence and concentration of energy to carry out a protracted technical and efficient research into the cause, the cure and the prevention of insanity, have never been realized.

No state has ever established a laboratory for research alone. In three states of the Union, institutions of one sort or another in which research was a minor function, have been established by legislative enactment, but, unfortunately, no work has ever been done in any of them at all proportionate to the importance and the urgency of the problem. In New York the Psychiatric Institute has become a school of clinical diagnoses and a training school for the members of the faculties of the New York State hospitals. No researches have been going on during the past two years. In Michigan the Director of Psychopathic Hospital, which supports a hospital of more than thirty beds on \$50,000 a year, is given up to the theory of the psychogenetic origin of all the insanities except general paresis, and he has no laboratory equipment and makes no adequate physical examinations. In Illinois the conditions of New York are closely duplicated, but some interrupted research work has been prosecuted. There is, furthermore, no private

institution or endowment, in the whole United States or in Europe, like that of the Rockefeller Institute in New York, or the Pasteur Institute in Paris, in which research into the causes of insanity is persistently pursued on a scale commensurate with the magnitude and complexity of the problem.

The conditions are not different in European countries. In the laboratory of the London County Council during the past five years some scattering investigations have been going on, but no such serious work has been pursued on the condition of the insane in the various stages of the disease as that which the publications from the Welcome Laboratory at Khartoum or from the Laboratory of Tropical Disease at Birmingham demonstrate relative to the diseases of the remote provinces and colonies in the torrid zone.

The lack of interest in the physical condition of the wards of the state is manifested by the equipment of the madhouses and the literature of the doctors of the insane. In a number of the state hospitals for the insane, where 2,000 patients or more are legally incarcerated, there exists today no such laboratory equipment as the poorest village hospital of sixty beds or less affords. The facilities for diagnosis in these state hospitals are those only of the parlor. Microscopes, incubators, test tubes, reagents, and the equipment for blood counts are absent or out of order, and a Wassermann reaction for diagnosing syphilis cannot be secured short of a special order from the board of control on the State Institute or the State University. Nothing in the way of research can be expected from such *quasi* hospitals.

The notion prevails quite widely in psychiatric circles that conscious research has

rarely been productive of direct achievement. We are reminded that the alchemists searched for the philosopher's stone—the means of changing the baser metals into gold—but this centuries-long research never accomplished the end sought for. At the same time, there was an equally Quixotic search for the fountain of life, but that also has never been discovered. These researchers, however, gave rise to the science of chemistry and advanced materially the science of medicine. The discovery of the cholera bacillus was the result of direct empirical research, and our knowledge of the means of preventing yellow fever followed immediately upon the investigations by the surgeons of the United States Army. The sleeping sickness and Kala Azar have been thoroughly illuminated by national commissions, and the causes and the methods of prevention discovered by conscious research.

Although the hook worm was known for many years, its significance, its relation to the "big lazy," was not recognized until after the Agricultural Department undertook to discover the reason of the inefficiency of the agriculturists of the South. Then began a rational and nation-wide effort to exterminate this filth disease.

We wonder, therefore, that so many psychiatrists hold this erroneous opinion, and that such trifling efforts have been made by the boards of control of the several states<sup>1</sup> to promote research into the physical

<sup>1</sup> Many readers may not know that the institutions, ordinarily termed charitable institutions, in most of the states have been placed in the control of administrative boards of three to seven salaried men appointed usually by the Governor of the State. In spite of the fact that one physician is usually on this board, the management is overwhelmingly commercial in all its acts. "Economy," "efficiency" and "availability" are the watchwords of the boards of control. Politics still plays its old game at

condition of the insane, on whose custody they expend from twenty-five to forty percent of the gross budgets of their several states. In 1912, the State of Illinois, for example, expended \$11,800 on the Psychopathic Institute, which is less than three-tenths of one percent of the \$4,000,000 which is lavished on the custody of the 14,000 insane. It is, moreover, a custody pessimistic of cure and careless of prevention. The total budget for the custody of the insane in the continental United States has not been published in recent years, but it cannot fall short of \$50,000,000 a year. Not \$50,000 a year is spent by the forty-eight sovereign states altogether in research for prevention and cure. Since the number of patients that recover from their insanity is extremely small, being less than ten percent of the admissions, this expenditure on custody is an almost complete economic loss. The only means of diminishing this loss seems to be in discovering methods of curing insanity after it has come on, or in acquiring methods of preventing its onset. Neither of these possibilities can be hoped for as long as we remain ignorant of the causes of insanity and fail to investigate the physical condition of the insane.

We have heard for many years that early commitment to the hospital for the insane increased the chances of recovery. It is doubly unfortunate, then, that many reformers and not a few scientists have recommended sterilization of the insane, an

the expense of the state treasure. The president of a Board of Control, drawing a salary almost equaling that of a governor of the state, neglected his duty to his insane wards, and made a half year's campaign at their expense. He now represents his state and presumably the sane citizens of the state in the United States Senate. What interest can such political spoilsmen have in a research which would eventually curtail the need of their princely disbursements?

ill-advised and premature measure that cannot fail to deter friends from the early commitment of those they may still hope are not permanently crazy. Legal commitment in open court by judges and jury, neglect of scientific investigation in the state hospitals, spaying and castration of the insane, the epileptic, the feeble-minded, and the criminal, all delay and restrict the therapeutic usefulness of the hospital and add an unearned load to the already galling burden of the unfortunate. With adequate research these mutilating and revolting operations, the advisability and usefulness of which have not yet been demonstrated by adequate research on the part of their advocates, might prove unnecessary.

#### REASONS FOR HOPEFUL RESEARCH.

In spite of the fact that many persons consider insanity due simply to perversity of conduct, and many others believe it to be due to an error of cerebration, there remains a great number of strictly reliable scientists and sane physicians who believe that it is due to some one or more underlying disease or diseases of a material, a physical, a chemical, or a biological nature. It is not at all improper to consider here some of the reasons for this belief and this contention.

All diseases of which we have any knowledge whatever are due to tangible, physical and clearly explicable mechanistic causes. No disease or condition whatever, in spite of the time-honored traditions of our ancestors, is due to the "evil eye" or "hoodoo." From decade to decade, from year to year, and even from month to month, we see diseases which have been previously considered quite as inexplicable and even as mysterious as insanity now is admitted to be become clearly understood—rationally

explained and resulting from adequate physical causes. Thus the child-bed fever, the cause of which was first suspected by Semmelweis and afterwards demonstrated by the bacteriologists, has been put under such control that the hospitals of Europe and America, where the death rate, fifty years ago, was doubly decimating, are now safer places for the prospective mother than isolated private houses used to be. Although we are ignorant of the ultimate causes of smallpox, the life history of the diseases is so perfectly understood, that this scourge, which used to kill one out of fourteen of the inhabitants of the earth and mark for life most of the remainder, is practically unknown, save to the sanitary police. The "black death," which for centuries swept the civilized world at irregular intervals, and was looked upon as a curse from God or as the machination of evil spirits, is now known to be the work of a little parasite, which is harmless to its natural host—the squirrel of Siberia, but fatal to the domestic rat, and the Mongolians and Caucasians who make rats their scavengers or messmates. And so we might review the mysterious and the so-called hereditary diseases of the past century—consumption, syphilis, putrid sore throat, infantile paralysis, cerebro-spinal meningitis, malaria, typhoid fever, typhus fever, elephantiasis, yellow fever, and the sleeping sickness—all of which filled the people with consternation and distracted the medical profession in attempts at their interpretation. By research each one of them has now been demonstrated to be due to a definite, tangible, rational, mechanistic, physical cause, and the reasons for consternation and distraction have disappeared with the mystery of their origin. And so it will be with the insanities.

It is the judgment of the world today that the diseases of plants and animals are due to discoverable natural causes. When the blight appears upon a crop of grain, the farmer no longer sacrifices to his gods or looks for errors in the planting time, dictated by the almanac maker or by a sophisticated astrologist, but he seeks for some parasite, some mould, some blight, and then through scientific research pursues this pest to its utter extermination. For this purpose the Department of Agriculture of the United States expends \$16,000,000 a year, and permanently employs a corps of scientific investigators, working under conditions most favorable to the efficiency of their undertakings. The advantages which have come from these researches have been inestimable in increasing the efficiency of agriculture, in preventing the failure of crops and the loss of cattle, and they have more than recouped the nation in the added products of agriculture the growing expenditures of our army, our navy, and our other non-productive departments of government. These national researches do not stop at the physical ailments of animals. The Agricultural Department looks for the physical causes of even the *mental diseases* of stock. The "loco disease," or the "crazy disease" of horses, cows and sheep, has been traced by the Department of Agriculture to a poisonous weed known as the loco-weed, and, moreover, a possible means of curing the disease and of preventing its onset has been recently set forth for experimental use.

The tame elephant occasionally goes crazy. The keepers recognize the disease by the beast's erratic conduct. The peculiar and characteristic glands on the elephant's forehead, at this time swell up, dis-

charge a glossy, sometimes offensive fluid, and occasionally suppurative, and must be cut open. The beast at last gets well or dies of the disease. This condition is a circular condition and during longer or shorter periods the animal is well and works at his usual occupation, but sooner or later the "musth," as it is called, appears again and the great beast must be chained up to await recovery or death.

The notion which once prevailed that this was a sort of "heat," and due to sexual disturbance, has long been abandoned by all except the most superstitious keepers.

In the State of Illinois, which has a revenue of a little more than \$12,000,000 a year, the appropriations by the present legislature for the insane and other dependents is not far short of \$4,500,000 a year. By the same bill, the Psychopathic Institute which devotes only a small part of its energies to research, received an appropriation of \$17,500 a year for a director, two stenographers, a janitor, a chemist, and three assistants. In this institution, during portions of the past two years, four very excellent men have been employed, and in spite of the necessity of giving much of their time to clinical work and to the instruction of medical classes from other state institutions, they have pushed forward some material inroads into our ignorance of youthful insanity. It is necessary to mention only two. The chemist has repeated the work of Waldemar Koch, cut short by his untimely death. He has proved that the brain in cases of youthful insanity has an abnormal and characteristic sulphur content. By physiologic methods, another investigator has cunningly demonstrated that a woman sick of youthful insanity and speechless for nearly ten years, was perfectly conscious of her desperate condition,

recognized her name, the names and condition of her friends, and exhibited decided mental excitement when told that efforts were being made to cure her. This demonstration accords with the history of the recovered cases of youthful insanity. These patients are simply hedged in by this disease from any possibility of expressing themselves, in spite of the fact that they have good memory of time and place and a painful consciousness of their own condition.

Such fickle, transient researches, carried on in Kankakee by careful, accurate, conscientious and capable investigators, under the most disheartening circumstances, show us that the 15,000 youths who are legally committed each year to the institutions for the insane in the United States are overcome by the avalanche of their disease and driven into a hopeless position not unlike that of miners buried in a burning coal mine, from which they are able to give to the outside world no token of their existence or of their horrible predicament; to be able to know all that is going on, and yet unable to speak a word, raise a finger or make the slightest mark of recognition!

The world is aroused by the contemplation of the plight of a few miners buried in the earth for a few hours or a few days until rescue, suffocation or starvation bring relief, but it remains unmindful of the conscious imprisonment for years and years of the fifteen regiments of youths trapped each year into a dungeon from which there is scant hope of relief by death and none by cure.

#### DIRECTION FOR RESEARCH TO FOLLOW.

Every physician who has seen a case of dementia precox come on in its acute maniacal form cannot fail to have recog-

nized the likeness of this onset to the onset of acute yellow atrophy of the liver, to delayed chloroform poisoning, and many other toxic conditions. The mania is the same. The loss of flesh and the sudden shrinking of tissues is similar. The presence of acetone in the blood and excretions and the enormous increase of red corpuscles in the blood are strongly suggestive of a similar origin. Possibly, the most conspicuous of all the common symptoms are the mental aberration and the acetone breath, and these two symptoms speak loudly for a serious toxic and, as the old physicians would say, constitutional disease.

Every physician who has observed closely the history of cases convalescent from severe infections of whatever sort, has noticed the remarkable periods of sleeplessness that follow—a sleeplessness which is almost impossible to overcome. We have the same sleeplessness with the same general mental symptoms in the early stages of youthful insanity. In fact, in many instances, it is the first and the only premonitory symptom which the physician can fix upon.

There is a condition, fortunately rare, appearing in youths and adolescents, that is known as cyclic vomiting. It comes on at intervals, sometimes more or less regularly, and it is attended by symptoms of toxemia, frequently with the sudden appearance of acetone in the breath, the urine and the vomited matter. This disease has sometimes been successfully treated by the use of glucose, which produces a saturation of acetone in the blood. The disease is apparently one of the many examples of a peculiar increasing susceptibility to a usually mild poison, which condition has been called anaphylaxis.

The physical condition of the cases of dementia precox should be thoroughly

studied from the standpoint of every sort of investigator. In order that their studies should be free from the errors of secondary infectious products, the patients studied should be put in perfect physical repair. The skin should be cleaned by a daily bath of the most rigid sort. The teeth should be put in perfect condition and made and kept scrupulously clean after each meal. The intestinal tract should be studied with rapid Roentgen pictures and the course of peristalsis determined. The fauna and flora of the intestines should be chartered under various conditions of diet and all the metabolic studies made that the internist might suggest. The serologic and morphologic studies of the blood should be carried on under the most accurate dietetic and hygienic regulations and coincidently with all the metabolic and other physical and biological observations.

Such a program requires a large corps of capable research men and a select body of masters in medicine. Such a work should be demanded of the boards of control in the several states by the friends of the insane and the lovers of humanity, and for such a work of prevention not less than ten percent of the amount now lavished on custody should be made available.

**Conclusion.**—(1). It is our contention that the opportunity of solving the problems of insanity is in the hands of the State, and that politically organized society is under an obligation which the administrative and legislative officers of the State have not adequately provided for but must, for economic reasons, ultimately assume. There is no private endowment which is undertaking the study of these problems on such a scale as to give us confidence in their solution by such endeavor.

(2). Up to the present time, no one of the ills of life, no matter how mysterious it has appeared during our ignorance of its condition, its cause, and its cure, has

ever proven to be due to anything except natural, physical causes, discoverable by the method known as scientific research.

(3). The very fact that the insanity of youth is not symptomatically unlike traumatic insanity, general paresis, alcoholic psychosis, the delirium of the infectious diseases and the frenzy of the toxemias, leads us to the reasonable presumption that its pathology can be made clear and rational by such biologic, chemical and physical researches (when pursued with sufficient faculty and equipment), as have been rewarded with success in these familiar instances.

(4). We have been convinced by the teachings of medical history and veterinary pathology that there are no mysterious God-sent or devil-brewed diseases. There are no mystical, intangible, unapproachable sources of sickness and death. For every effect there is an adequate cause and for similar effects similar causes. We have every faith in the unity of natural phenomena and the existence of an adequate, tangible, rational, consequential, mechanistic cause for every malady, even though its major symptom may be a disorder of the human mind.

(5). To the modern scientific mind and in enlightened public opinion there are no "hoodoos," no "evil eyes," no "curses," no "banshees," no "twisted ideas," or anything like them, adequate to drive annually fifteen full regiments of our brightest youths into hopeless custody and start them on an irrevocable physical decline, to end either in permanent confinement or in early death.

(6). That society and that civilization are not fit to exist and can not long exist that expend a munificent quarter or more of the state budget on the pessimistic custody of its unfortunate citizens and yet provide no proportionate means of solving the riddle of insanity by such methods as have proved adequate to solve the problems of equally mysterious maladies.

(7). Psychiatry presents the most promising field for research and dementia precox is the most important clinical group awaiting a scientific study and means of cure or prevention.

## SPINAL SUBLUXATIONS: THEIR EFFECTS; SCOPE, LIMITATIONS AND RESULTS OF TREATMENT.

BY

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The writer, during youth, was repeatedly exposed to mumps, but escaped infection. Later, while a senior in medical college, he, with several class-mates, provided an interesting and protracted mumps clinic. It is not an infrequent occurrence for part of the children in a family to have diphtheria, while others escape—and this, too, without any immunizing doses of anti-toxine. Nearly every one walking the streets of New York, inhales every day enough tubercle bacilli to threaten infection, yet relatively few become tuberculous.

Whence this varying vulnerability and immunity in different individuals, and in the same individual at different times?

Much use has been made of the expression, "tubercular predisposition." What means this "predisposition" to tuberculosis, or to any other disease, especially since the children of tuberculous and of non-tuberculous parents both have and escape the disease? Moreover, of those who become tuberculous but few, if any, become so primarily, but only secondarily as a result or sequence of some other and preceding indisposition; and of those who become infected, why is one infection centered in the lungs, another in the bones, or joints, or peritoneum, etc.?

We are told that the uninfected possess such a degree of vital resistance, or auto-protective power, as to deny the infective agent a suitable and fertile soil upon which to operate and propagate; and this can

mean nothing less than that the selected zone of invasion, for the particular morbid agent, is structurally and functionally normal.

While an assertion to the effect that perfectly normal innervation of an organ or tissue insures normal function thereof might, under certain conditions, be open to challenge, it will hardly be denied that normal function is impossible in the absence of normal innervation.

Hence at least one rational procedure in the presence of disease, more especially of the so-called "functional" disorders, would seem to be, to search for and, if found, relieve, remove or correct any hindrance to such normal innervation.

And where is such interference most likely to be located?

In the cranium and spinal canal the great centers of the nervous system are securely protected from mechanical injury, save of very unusual violence. Of firmer consistency than any other tissues, save bone, cartilage, ligament and tendon, in the extremities and in the cavities of the trunk the nerves are not liable to continuous and severe pressure or irritation. But if a nerve, in its course, pass between two movable bones whose normal relations are subject to disarrangement, at this point will irritation of that nerve be most likely to be found.

Every one of the thirty-one pairs of spinal nerves pass just such a point at the intervertebral foramen. And here spinal subluxation plays its mischievous part.

The intervertebral foramen is bounded, superiorly, by the notch in the lower margin of the pedicle of the vertebra above; and, inferiorly, by the notch in the upper margin of the pedicle of the vertebra below; while other tissues serve to complete

the foramen, which transmits the spinal nerve and its accompanying vessels.

Now let excessive stimulation, through traumatism or reflex or other irritation, of any of the fibrous structures which connect the vertebrae, result in undue and continued contraction of some of these tissues, and there will result abnormal approximation, flexion, rotation, horizontal displacement or other disturbance of relation between adjacent vertebrae; and, no matter how slight the lesion, it will produce a change in the shape, or size, or both, of the intervertebral foramen; this will cause interference with the transmitted nerve, the end result of which is disturbance of function, if not of structure, in tissues innervated by the impinged nerve.

As to the exact tissues primarily affected, or subsequently involved, through this foraminal interference, there is room for argument.

It may be contended that this interference is in the nature of direct compression and diminished diameter of nerve fiber, thus lessening its carrying capacity; the current delivered by a conductor of electricity varies inversely as the square of the diameter.

Again, this foraminal change may, by interference with the circulation, modify the chemic texture of the nerve fibers, or it may thus alter the nutrition and functional energy of the spinal-cord segment from which arises the impinged nerve; to again revert to electro-dynamics for further illustration, not all metals conduct electricity with equal facility, nor do all cell elements generate an equal volume of current.

But, without being dogmatic, certain facts seem to support the assumption that the effect of the foraminal change is a direct nerve interference: for instance, not

infrequently a patient suffering severe pain in some part of the body will seek and find a position of the body which affords complete or partial temporary comfort, the pain soon recurring when this position is abandoned; again, the almost instantaneous relief of certain acute ailments, especially if of a painful nature, by adjustment of a subluxated vertebra could hardly be accounted for by a chemic reorganization of nervous tissue consequent upon normalized circulation, as this would require a much greater length of time than elapses between treatment and relief in such acute and painful conditions. In the more chronic and more slowly relieved cases, both forms of local injury may be the effect of subluxation.

Another, and scarcely debatable, effect of spinal subluxation is change in the shape of the articular cartilages and the fibrocartilaginous intervertebral disks—especially as the result of pressure long continued in chronic cases. The presence or absence of these pressure changes expresses very correctly the difference between recent and long-existing lesions, and influences, also, the number of adjustments necessary to the removal of the morbid, and the restoration of normal, conditions.

The "neurasthenic spine" is a feature of different forms of ailments bearing various disease name labels. What is the real essence of this neurasthenic spine? It is a spine in which there is one or more subluxations.

Irritation along the course of a nerve is referred to the area of distribution of that nerve. The fibers of the posterior primary divisions of the spinal nerves are distributed to the muscular and cutaneous tissues of the spinal region; here will be found hyperesthetic areas or spots when a spinal

nerve is irritated through foraminal alteration due to subluxation; but, in the vast majority of cases, both patient and physician will be unaware of the existence of these hyperesthetic places until palpatory examination reveals them: coincidentally there will also be deranged function or sensation, if not both, in remote visceral or other tissues supplied by the anterior primary division of the same nerve, whether these tissues be supplied directly by the white fibers of the cerebro-spinal system, or indirectly via the relaying gray fibers of the sympathetic system.

As spinal subluxations are structural faults, the treatment is, of course, mechanically corrective in character, the hands being the instruments used: and, for this method of treatment, or therapeutic resource, I have proposed the term "Chiroprathy."

The patient's body is placed in such position as to most favor the movement of the subluxated vertebra in the direction desired, and so as to secure, also, the greatest degree of relaxation of the spinal tissues. The hand is then so placed in contact with the patient's body as to provide the firmest hold of some part of the hand, usually a bony prominence, upon the spinous process, or a transverse process, or both, of the lesioned bone, and a suitable degree of force applied in the appropriate direction. In certain forms of spinal lesion, torsion of the trunk is a suitable method of correction, while in some varieties of spinal subluxation, the vertebra is acted upon indirectly through the ribs.

In the last analysis, the essential factor in many, if not all, pathologic conditions is over- or under-activity of function; and the desired ultimate and actual effect of much of our medication is either stimula-

tion of depressed, or sedation of excessive, function of the tissues wherein are most prominently exhibited the symptoms of disease.

In contrast with these results, the effect of the removal of foraminal interference with the transmitted nerve, through correction of vertebral subluxation, is neither stimulation nor depression, but the removal of the cause of whichever of these is present, allowing normal innervation to promote normal function.

Under certain conditions, as yet illy differentiated, some subluxations tend to a gradual, and quite often rapid self-correction, while others show a disposition to advance and become more fixed or aggravated. In the first instance we have examples of spontaneous recovery—the patients get well under any or no treatment. In the second class we find the chronics who fail to get well under any and all kinds of medication, and whose symptoms frequently change from time to time with the continuance and progress of their ailments. With these the foraminal alteration from normal varies as the subluxation advances or becomes more aggravated, and the symptom-complex may differ from stage to stage, according to the nerve fibers that are successively impinged or released from impingement; for, let it be remembered, a lateral subluxation of a certain vertebra will produce different symptoms than a rotary subluxation of the same bone, while an associated lateral and rotary subluxation at the same place will cause a still different array of symptoms—all depending upon the particular fibers of the nerve trunk compromised.

It is in the treatment of these chronic cases that have passed through a suc-

sion of grades or varieties of symptoms, that may so often be observed what might be termed a retracing of symptoms; as the treatment progresses, and the subluxated vertebra is gradually returned to normal relations with its adjacent neighbor, the symptom-route seems to be traveled in reverse order—though of course much more rapidly—and the very earliest symptoms noted may be the ones last experienced before the cure.

While of course not in any conceivable sense of the word even a near-panacea, chirotherapy is of distinct, irreplaceable and extended value in the treatment of *properly selected cases*, and I believe it to be a vastly more serviceable and dependable therapeutic agent than hydro-, electro-, and some other therapies now at the physician's command.

The very patent and indisputable fact that, through its employment by many illiterate and generally unqualified sectarian practitioners, large numbers of sufferers who had failed to secure relief through recognized remedial measures have been readily and permanently cured, at least symptomatically, of a wide range of disease conditions, does not by any means discredit, but most emphatically confirms the value of the method.

To the parallel fact, that the method has been practiced almost exclusively by those who were so ignorant as to be unable, or so vicious and avaricious as to be unwilling, to discriminate between suitable and unsuitable cases, is due in large measure the disrepute which it has earned. Everything which came to these monotherapists' mill was grist; hence the mass of negative harm which they have done by preventing the employment of suitable and effective meas-

ures where and when this method was, and could but be, neither adequate nor indicated.

If there were desired a completely convincing demonstration of the truth of the adage that "a little knowledge is a dangerous thing," that proof appears in the absurd scheme to erect upon this *one* therapeutic measure, a "school" or "system" of practice—a plot to foist upon the public another pseudo—"science," which should arouse and enlist the active, aggressive, united and determined opposition of every citizen, whether lay or professional.

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## SOME REMARKS ON THE TREATMENT OF ACUTE SURGICAL INFECTIONS.

BY

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Since the phylacogens of Schafer were presented to the medical profession much has been reported concerning their value in bacterial diseases. In many instances their therapeutic effect has been very satisfactory indeed, and in not a few cases it may be regarded as startling. In the study of a comparatively new therapeutic agent reports of the cases in which the agent has been employed with as accurate observation as possible, may be regarded as determining the therapeutic value of the agent.

*Case I.*—E. V. O., aged 26, male. Admitted to French Hospital, December 3, 1911. Diagnosis: Appendicitis with rupture, and local purulent peritonitis.

Operation December 4th. The appendix was found ruptured and there was marked local purulent peritonitis. On the seventh day following the operation the patient had gradually passed into the so-called typhoid state, with dry tongue, delirium, etc.

Dec. 11, 4 P. M., T. 100.2, P. 100, R. 24. 5 cc. mixed infection phylacogen, subcutaneously. 12.00 P. M., T. 101.8, P. 86, R. 24. The wound sloughed.

Dec. 12, 4 P. M., T. 100.4, P. 82, R. 24. 10 cc. mixed infection phylacogen, subcutaneously, 8.00 P. M., T. 101, P. 94, R. 24.

Dec. 13, 4.00 P. M., T. 100, P. 64, R. 20. No injections administered. The wound, though it had sloughed, cleared up with astonishing rapidity after the second injection.

Dec. 14, 12.00 M., T. 100, P. 62, R. 20. 3.30 P. M., 10 cc. mixed infection phylacogen, subcutaneously. 8.00 P. M., T. 100.2, P. 60, R. 20.

Dec. 15, 4.00 P. M., T. 100, P. 60, R. 20. No injection given on this day.

Dec. 16, 4.00 P. M., T. 99.2, P. 60, R. 20. 5 cc. mixed infection phylacogen, subcutaneously. 8.00 P. M., T. 99.6, P. 60, R. 20.

Dec. 17, 8.00 P. M., T. 99.4, P. 60, R. 20.

Dec. 18, temperature, pulse and respiration became normal and remained so.

No reactions followed the use of the mixed infection phylacogen in this case, but from the first injection the most astonishing results were noted. This is the first case in my experience in which a recovery resulted in a case of sepsis which presented the clinical aspect that obtained in this instance, i. e., picking the bed clothes, low muttering, delirium, etc. The first injection of phylacogen was followed by improvement and the patient was discharged January 6, 1912.

*Case II.*—C. W., aged 11, female, school-girl. Diagnosis: Acute appendicitis, with systematic infection. No cultures were made. Admitted to French Hospital October 24, 1911. History: Twenty-four hours after the first symptoms of appendicitis the abdomen was opened and a large sausage-shaped infected appendix removed, the small veins in the mesentery of the appendix were filled with thrombi and at the time of operation the patient presented a picture of overwhelming infection. Temperature 102.5, pulse 124.

Eighteen hours later the temperature rose to 104.4, pulse 160.

Oct. 25, A. M., T. 104.4, P. 160, R. 28. 3.45 P. M., 3 ccs. mixed infection phylacogen, subcutaneously. 4.45 P. M., T. 103.4, P. 160, R. 28. 6.45 P. M., T. 103.2, P. 120, R. 22. No reaction; urine amber-colored; 130 ccs. were passed. 8. P. M., T. 102.8, P. 128, R. 24.

Oct. 26, patient slept fairly well after midnight; was restless before that time. This morning patient complains of abdominal pain. 10 A. M., 5 ccs. mixed infection phylacogen, subcutaneously. 11 A. M., T. 101, P. 100, R. 24. Patient felt uncomfortable during the early part of the day. 2. P. M., T. 102, P. 110, R. 24. 3.00 P. M., the patient a little drowsy and complains of a little pain in the arm at site of injection. 4.00 P. M., patient voided 120 ccs. of urine. T. 102.2, P. 120, R. 28. 8.00 P. M., T. 104.4, P. 108, R. 24. 12.00 midnight, T. 100.8, P. 104, R. 24.

Oct. 27, patient slept well and all nourishment taken was well retained.

The temperature was about 100 and gradually dropped until it became normal and remained so.

All the evidences of infection rapidly disappeared and the patient made a rapid convalescence.

*Case III.*—C. K., female. Admitted to Harlem Hospital May 11th, 1912. Diagnosis: Double pyosalpinx following abortion. Culture shows streptococcus

May 12, temperature from 100 to 104, pulse from 96 to 120; leucocytes 22,000.

May 13, operation; double colpo-salpingectomy and appendectomy. Large amount of foul smelling pus found free in the abdomen. Drainage established.

May 14, T. 100 to 104, P. 114 to 140.

May 15, T. 101.9, P. 128, mixed infection phylacogen, 5 cc. subcutaneously.

May 16, T. 99.5, P. 104, mixed infection phylacogen, 5 cc. subcutaneously.

May 17, T. 98.8, P. 104, mixed infection phylacogen, 10 cc. subcutaneously.

May 18, T. 98.6, P. 90.

May 18th to 20th, temperature from 97.6 to 99.8. Pulse from 90 to 124.

May 20, T. 98.6, P. 90, mixed infection phylacogen, 10 cc. subcutaneously.

Rapid improvement from first dose. No severe reaction. Patient discharged completely recovered.

*Case IV.*—A. B., female. Admitted to Harlem Hospital February 13, 1912. Diagnosis: Acute gangrenous appendicitis. Operation: Appendectomy. February 14th, much sero-sanguinous pus found in abdomen. Appendix ruptured. Plastic peritonitis about appendix and ileum. Abdominal cavity sponged dry and closed without drainage.

Temperature from February 14th to March 18th of septic type from 99.5 to 105. Pulse 108 to 132.

March 18, T. 99.3, P. 110, 5 cc. mixed infection phylacogen, subcutaneously.

March 19, T. 99.2, P. 112, A. M.; T. 103.8, P. 126, P. M.

March 20, T. 99.3 P. 94, A. M. 10 cc. mixed infection phylacogen, subcutaneously. T. 105, P. 138, P. M.

March 21, T. 99.3, P. 94, A. M.; T. 101, P. 124, P. M.

March 22, T. 100.2, P. 98, A. M., 5 cc. mixed infection phylacogen, subcutaneously. T. 103, P. 136, P. M.

March 25, T. 100.2, P. 102, A. M. 10 cc. mixed infection phylacogen, subcutaneously. T. 102.2, P. 108, P. M.

March 26, 27 and 28, temperature from 100 to 103.3, pulse from 102 to 120.

March 29, T. 102, P. 114, A. M. 10 cc. mixed infection phylacogen, subcutaneously. T. 101.2, P. 110, P. M.

March 30, T. 100.3, P. 108, A. M. 10 cc. mixed infection phylacogen, subcutaneously. T. 103, P. 114, P. M.

April 1, T. 99.3, P. 104, A. M. 5 cc. mixed infection phylacogen, subcutaneously. T. 101.2, P. 90, P. M.

April 2, T. 99.6, P. 96, A. M. 10 cc. mixed infection phylacogen, subcutaneously. T. 100.8, P. 110, P. M.

April 3, T. 99.4, P. 94, A. M. 10 cc. mixed infection phylacogen, subcutaneously. T. 100.8, P. 118, P. M.

April 7, T. 99.2, P. 108, A. M. 5 cc. mixed infection phylacogen, subcutaneously. T. 99.5, P. 90, P. M.

April 8, T. 98.8, P. 96, A. M. 5 cc. mixed infection phylacogen, subcutaneously. T. 100.4, P. 104.

April 9, T. 99, P. 90.

Ten doses—95 ccs.

*Case V.* W. B., male. Admitted to Harlem Hospital, April 22, 1912. Emergency case. Traumatic amputation at knee, in-

fected. Temperature on admission 103.6, pulse 124.

April 25, surgical amputation, T. 105.9, P. 124.

May 3, T. 102.5, P. 90. mixed infection phylacogen, 5 cc. subcutaneously.

May 4, T. 99.2, P. 104. mixed infection phylacogen, 5 cc. subcutaneously. T. 104.8, P. 128.

May, 5, T. 104.2, P. 108. Mixed infection phylacogen, 5 cc. subcutaneously. T. 104.8, P. 106.

May 6, T. 101.2, P. 108. Mixed infection phylacogen, 10 cc. subcutaneously. T. 103.2, P. 100.

May 7, T. 102, P. 108. Mixed infection phylacogen, 10 cc. subcutaneously. T. 105, P. 110.

May 8, T. 101.2, P. 110. Mixed infection phylacogen, 10 cc. subcutaneously. T. 102.5, P. 100.

May 9th to 15th, temperature ranged from 100 to 103. Pulse ranged from 96 to 120. Did not receive phylacogen during this time.

May 15, T. 99.5, P. 100. Mixed infection phylacogen, 10 cc. subcutaneously. T. 104.3, P. 112.

May 17, T. 99, P. 96. From this time a gradual decline to normal took place.

Seven doses of mixed infection phylacogen were given, making a total of 55 cc.

May 4th, culture from infected stump shows staphylococcus.

#### BLOOD EXAMINATIONS.

Date.	5/4	5/6	5/7	5/9	5/11.
Leuco.	13000	14300	12000	13000	15000.
Poly.	89	87	85	87	83.
Trans.	1	4	2	2	
Lympho.	10	9	3	9	15
Large Lym.			10	2	2
Hemoglob.	90	90	90		
Eryth.	3900000				

Although only five cases are here reported the fact that favorable outcome obtained in a class of cases which are uniformly fatal would seem to justify this report. Especially in the first four cases, the outlook was exceedingly unfavorable, each patient seeming to be suffering from an overwhelming infection.

It is in connection with just such cases as this that the use of phylacogen is in-

dicated to the best advantage. In severe systemic sepsis the administration of vaccines at intervals of a few days would scarcely seem to be sufficiently prompt in action to obviate a fatal issue. On the other hand results from phylacogen injections may be seen within a few hours, and, with doses given at twenty-four hour intervals a sufficiently active course of treatment may be carried out to give the patient the best possible chance for recovery.

The phylacogens are of considerable value to the internist; but, to the surgeon, who has comparatively few remedies to depend upon in combatting severe surgical infections, they will be welcomed as exceedingly valuable therapeutic agents, as their action is prompt and quite satisfactory. They are indeed worthy of the careful consideration of every conscientious medical and surgical practitioner.

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## MASKED HOMOSEXUALITY.

BY

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(The instruction in the physiology and psychology of the sexual functions given in our medical colleges is so ridiculously inadequate that a few preliminary remarks on the subject of homosexuality may not be unwelcome to most readers. It is almost unbelievable, but it is none the less true, that there are physicians even in New York City who have never heard of homosexuality and who do not know that such a con-

dition exists. When we say that a person is *homosexual* we mean that he loves (is sexually attracted to) a person of his own sex. The so-called "normal" arrangement is, of course, to love a person of the opposite sex (*heterosexuality*). Freud has divided homosexuals (or "inverts") into three classes. The *absolutely inverted* cannot love a person of the opposite sex or are disgusted at the thought of sexual relations with them. The *amphigenously inverted* (i.e. the *psychosexual hermaphrodites*) can love a person of either sex. The *occasionally inverted* are "normal" persons who love a person of their own sex when a person of the opposite sex is not obtainable, (e.g., in prison, in the army or navy, on shipboard, in boarding-schools, etc.). Many attempts have been made to explain or account for the phenomena of homosexuality. The best-informed thinkers are now agreed that by nature all human beings are psychically *bisexual*—capable of loving a person of either sex; that as a result of various social forces the homosexual tendency is repressed as the individual attains adulthood and the heterosexual tendency is developed and established as the "normal." But this repressed homosexual tendency is not lost or exterminated; it associates itself with the other or ego-impulses and manifests itself in sociability, comradery, friendship, and humanitarianism. If, however, there is any disturbance in the evolution of the individual to heterosexuality, the tendency to inversion becomes firmly or partially "fixed" and gives rise to the phenomena of homosexuality that we shall discuss, as well as others which do not now concern us.—T.).

The more deeply we penetrate into the psychic mechanisms of the neuroses and the psychoses the greater do we find the

significance of the tendency to homosexuality. The differences between the psychoanalytic findings and the conventional "history" are nowhere more striking than in the statements of neurotics on the subject of homosexuality. There is *no other sexual complaint that is subjected to so much repression as this one* or of which the patient professes so much ignorance. Why this should be so is not quite clear. There are persons who have indulged in many sorts of perversions and who have, nevertheless, wholly repressed the homosexual component. One of Stekel's patients was a woman with a very eventful prostitution history who became neurotic because she could not overcome and suppress her homosexuality. Like all neurotics she masked her homosexuality so cleverly that she herself did not know of its existence. (Unconsciously she converted her inverted craving into symptoms which were quite acceptable to her conscious self. The symptoms were, therefore, a compromise between her unconscious longing and her conscious repugnance thereto.—T.).

The beginner in psychoanalysis will do well to acquaint himself with the different disguises that homosexuality may assume. It must be borne in mind that *all neurotic symptoms are the results of a compromise* and reveal as much as they conceal. The tendency to these compromises is the expression of the splitting of the personality and calls for an investigation. The most contradictory impulses are gathered together and fused into one symptom. (That is, *each symptom is overdetermined*—has many meanings.—T.). The tendency to compromise dominates the soul of the neurotic. If the striving to fuse the conflicting forces into *one* symptom fails there results the well known picture of irresolution, hesi-

tation, vacillation, and doubt. (Neurotic) doubt means an unsuccessful attempt at compromise.

The superficiality of the compromise is most easily discovered in the individual's homosexuality. It is the neurotics' earnest desire to satisfy as many of their impulses as possible in one object. Their ideal would be a being that should be at once a man, woman and child, and possibly also animal and angel! (Parenthetically it may be remarked that the Catholic Church has taken cognizance of this fixation requirement of the libido. The Holy Family gives scope for the fixation of the libido by sublimation and finds an outlet for all the components. Not even the Lamb is lacking!) In the description of their ideals given by neurotics we shall always find that their polymorphous tendencies are not left out of consideration. Men go into raptures over women with marked masculine traits: a large and robust frame, flat chest, prominent bony features, short hair, a deep voice, a suggestion of a beard or a mustache. In this way they obtain their secret bisexual ideal (a woman with a phallus or a man with a vagina!). In this way the repressed impulses are partially put at the service of the libido, and united with the heterosexual component and made serviceable in the quest for pleasure and for self-assertion (aggression). If nature has not endowed the sexual partner with the coveted attributes (flat chest, hairy chin, etc.) the invert calls certain external accessories to his assistance, e. g., articles of clothing or ornament. *The symbol must replace the reality.* (This is the explanation also for many manifestations of fetishism.—T.). Men fall in love with women who wear male apparel or some object suggestive of male apparel, e. g., a derby, a military coat,

a cane, etc. Thus it happens that they fall in love with actresses (playing male roles), swordswomen, female bicyclists, women in riding habit, prostitutes whom they have seen in drawers, etc. Others require their sexual partners to put on some article of man's clothing before their libido can be sufficiently aroused. Or they take great pleasure in seeing their beloved wear an article of male clothing or some object that will create an illusion of reality. (*The craving for realities*)!

Exactly analogous phenomena may be observed in women. They fall in love with effeminate looking men (beardless, gynecomastia, a strong panniculus adiposus, a broad pelvis, a round neck, a soft voice), men with long hair, or men wearing long cloaks. Very dangerous to such women are the following: a priest in his cassock, a physician in his gown (especially if he have his sleeves rolled up), female impersonators, beardless men with soft voices (especially if they are addicted to the use of perfumes and sleeve garters), artists with long curly hair, etc.

Psychic peculiarities have, of course, to be reckoned with. Neurotics are very powerfully affected by women who smoke, ride, shoot, climb mountains, or otherwise manifest mannish tendencies of an aggressive nature. Women are similarly susceptible to men with specific feminine traits. Many neurotics want to be taken possession of by somebody. (*Pleasure without guilt* on their own part)! Energetic women fascinate them, just as the apprehensive and sensitive man powerfully attracts the hysterical woman.

Less well known are the homosexual masks that are now to be mentioned. A homosexual impulse is frequently concealed behind a love for old women (*geronto-*

*philia)* or a love for children (*pedophilia*). So all persons who depart from the masculine or feminine type may exert a sexual influence on neurotics. Age obliterates the secondary sexual characteristics. In old age man approaches woman in appearance and woman acquires exquisite masculine characteristics (hairy lip and chin) and masculine habits. (It is not unusual for old women to take to smoking, etc.). Children also exert a bisexual influence.

A somewhat peculiar manifestation of masculine homosexuality is an *attraction for prostitutes*. In the presence of a *puella publica* the man is under the influence of the unconscious idea (based on the homosexual component) that she was heretofore possessed by other men. This process—attraction to a homosexual object by way of a person of the opposite sex—also plays an important part in other respects. The man loves to resort to a prostitute in the company of one or more men. The perverse desire to indulge in coitus in common with others and in one room, or to watch others in the act or to be watched, is founded in unconscious homosexuality (as well as in unconscious voyeurism and exhibitionism). New Yorkers may be reminded of certain exclusive and expensive resorts known as "circuses" where people were given the opportunity to satisfy these perverse cravings.—T.).

This enables us to understand the role of the "party of the third part" in *the marital triangle*. Some husbands delight in inviting male visitors to the house because they love them (unconsciously) and their passion for their wives takes fire through the idea that the visitors love the women. (This is quite different from that joy of possession which is increased by the idea that others covet what one possesses.—T.).

*Pathologic jealousy* too betrays a strong homopsychic component. In one case a physician's wife suffered intense agony every time her husband was closeted with a female patient whose appearance pleased her. She wished him to restrict his practice to male patients, because she could not believe that a man could resist the charms of beautiful women. In her imagination she lived over the scenes in the consulting room, and finally she prevailed upon her husband to permit her to peep into the room when he examined female patients. She said she did this to assure herself of her husband's fidelity; in reality she craved to admire the women and to gratify her homosexual longings.

A very transparent type of homosexuality is the *Don Juan*. He is ever on the hunt for an ideal which constantly eludes him. He is really seeking a man, and he is therefore very soon disappointed in the love objects whom he had prosecuted and wooed with such ardor. (Other types of Don Juanism are seen in men who are seeking their mother or sister or other female relative with whom they were intimately associated in their infancy. It may be as well to remind the reader untrained in psychanalysis that, as we have learned from Freud, homosexuality has its root in the man's identification of himself with his mother and his search for an effeminate young man whom he can love as his mother loved him; when he finds such a one he has really found only himself. All love is only self-love; one loves in the beloved only what one finds of himself in the beloved. For a further discussion of "*the mechanism of homosexuality*" the reader is referred to Prof. Freud's invaluable and epoch-making book, "*Drei Abhandlungen zur Sexualtheorie*," not to the error-laden

English translation.—T.). (Many) prostitutes and nymphomaniac women are homosexual. They are never satisfied or are even frigid (i e. anaesthetic) because they are really seeking a woman. (But the physician must be on his guard. Not every woman who claims to be an "icicle" is such. Women are notorious liars in sexual matters. And many women are genuinely frigid—until they find the man they love.—T.).

In many cases homosexuality betrays itself in the specific *mode of intercourse* adopted by the patient. Men may prefer to take the position "normally" occupied by the woman or to perform the act *a posteriori* or *per anum*. Women show similar tendencies. They experience an orgasm only when they are on top. (One of my patients indicated her homosexuality and her "masculine protest" in this indignant utterance: "Everywhere, even in the Bible, woman is placed under the man!"—T.). Some of the perversions, e. g., fellatorism, cunnilingus, are indicative of homosexuality as well as of sexual infantilism.

Certain *external signs* (sometimes) reveal a strong homosexual component or its sudden outbreak. Suddenly (and for no apparent reason) a man has his beard shaved off, or he suddenly begins to take an active interest in such sports as permit him to see naked men. He becomes passionately fond of prize-fighting, boxing, sun baths, Turkish baths, gymnasias, or becomes an active and enthusiastic champion of similar fads. A woman suddenly discovers that her long hair is a nuisance and has it cut off. Sometimes she does this without telling her husband about it so that she may afford him a "pleasant surprise." She changes the fashion of her garments, loves to wear jackets and very tight fitting

clothes, derbies, alpines, and begins to take an interest in the movement for women's rights. (In a very large percentage of active suffragettes the driving force is the unsatisfied sexual desire. She wants what the man has. The woman craves to have the man's "right" to indulge in premarital or extramarital coitus. In others the driving force is the repressed homosexuality: the desire to associate with women. Only very rarely, if ever, do women whose libido is satisfied take any interest in the suffragette movement.—T.).

*Dying together* is another mask for homosexuality. Persons who have not the courage to live together, die together. A double suicide, from ideal motives, in the case of two men or two women is always attributable to homosexuality. A life that cannot adequately gratify the persistent unconscious cravings is not worth living. Frensen beautifully says: "To him who takes no interest in the sun, moon and stars, they tell no story; and when one ceases to enthuse over his household it totters into decay. This is true of everything. Indifference kills; love endows all things with life." (It was after he had ceased to love that Hamlet said: "This goodly frame, the earth, seems to me a sterile promontory; this most excellent canopy, the air, look you, this brave o'erhanging firmament, this majestical roof fretted with golden fire—why, it appears no other thing to me than a foul and pestilent congregation of vapors!—Man delights not me; nor, nor woman neither."—T.).

Another mask for homosexuality, to which I can refer only briefly, is that of persons of the same sex going on long and frequent journeys together. Behind the *impulse to travel* is the identification with one's mother and the desire for union with her. In this

way the journey is a symbolic fulfillment of the repressed desire to elope with one's mother. So too the passion for the exploration of unknown regions of the earth, "our mother earth," owes some of its intensity to the homosexual component. (An extremely interesting paper on this subject, by A. Winterstein, will be found in *Imago*, No. 5, Dec., 1912.—T.).

All psychanalysts know that onanists who cannot give up the habit of *masturbating* are satisfying a homosexual impulse, among others, in their autoerotic activities. The feeling of guiltiness from which they suffer emanates in part (but in part only!) from this source. The greater the difficulty to give up the masturbatory habit the stronger does the homosexual tendency seem to be. Many of these onanists are asocial and shun company. But there are some among them who take an extremely active interest in social and fraternal organizations of all sorts. That female agitators are strongly homosexual is well known and furnishes themes for the humorists connected with the comic journals. Less well known perhaps is the fact that some of these agitators are rabid onanists and active homosexuals.

Another mark for homosexuality is that which may be designated as *the artistic*. Male novelists and dramatists (e. g., Shakspere) who excel in the portraiture of women and who delight in female portraiture are to a certain extent homosexual. They penetrate into the souls of women because they have a large share of the woman in themselves. Chamisso excelled in describing woman's love because, as his portraits show, he was a woman. With painters and sculptors it may be just the opposite. They prefer to paint manly feats or carve male figures. They betray their

homosexuality in their esthetic judgments. Some find the male body very esthetic, whereas others think it "disgusting." The homosexual component manifests itself in the affective repugnance as well as in the affective predilection. (A homosexual manifestation that has received very little study is strikingly illustrated in Shakspere's fondness for devising such situations as make it necessary for his female characters to assume male attire, e. g., Rosalind, Viola, Portia, Nerissa, Imogen, etc.—T.).

The choice of a *pseudonym* may also prove to be a characteristic symptom. Just as *transvestites* (as Hirschfeld calls those persons who have a passion for masquerading in the clothing of the opposite sex.—T.) clearly betray their homosexuality so also do those male writers who choose feminine-sounding pseudonyms for their anonymous writings, e. g., La Wara Ilona Illonay, Bertha M. Clay, etc. (The same thing, of course, occurs also in women, e. g., George Eliot.—T.). It is true that in the case of women authors there is the additional motive of the belief that their works will receive more attention if the public believes they were written by men. But in this very fact they betray the desire to be considered men. One of these objected to this theory with the argument that she delights in the company of men. She is a Messalina. But her flight from man to man really betrays the homosexuality which does not permit her libido to be satisfied. She preferred the society of well-known "lady-killers," typical Don Juans. The fantasy of the victims of these artists in love plays the chief role. These men bear about them the aroma of numerous women. These men are artists and she hopes to be treated to unusual sensations at their hands; but she is doomed to

disappointment for she tires of them very quickly; the unsatisfied homosexual has very little to offer to the unsatisfied homosexual of the opposite sex. (This explains many unhappy marriages!). It is a very interesting question to determine why to the lady in question, who permitted herself a great deal of sexual freedom, homosexuality was strictly taboo. The solution of this problem is still remote. Marcinowski has expressed the opinion that the cause for this repudiation of homosexuality is the coalescence of the homosexual impulse with the father-complex (i. e. an unconscious love for one's father,—T.) with which an intensely religious feeling is associated. Alluring though this theory is, it is open to the objection that it does not square with the phenomenon of homosexuality in women. Or are we to assume that the inhibitions also apply to the mother? But if so, why should they not also apply to the father, i. e. to the heterosexual? Why should the homosexuality in these cases conceal itself behind displeasure and disgust, instead of expressing itself in respect and reverence? Stekel suggests whether the cause is not to be found at least in part in the teleological conception of sexuality. Most persons cherish the belief that heterosexuality was "ordained" for the purpose of propagating the species. And if this be so, homosexuality has no place in nature. (It has occurred to me that the reasons for the greater reluctance to recognize a homosexual impulse in oneself are due, among other things, to the fact that homosexuality is much more infrequently practiced among human beings than perversions. Relatively few persons are conscious of any homosexual cravings as compared with perverse longings; almost all persons linger for a greater or shorter period at the coital fore-

pleasures, and many of these feel that they could indulge in perverse acts in conjunction with a beloved heterosexual partner. Moreover, references to perversions are much more common in the comic journals and at the card table and in cafes than to inversions. Because they are better acquainted with perversions and more familiar with such inclinations in themselves, perversions are less repugnant and less revolting than inversion. Another reason is the association of insanity with inversion in the popular mind.—T.).

The above does not exhaust the list of the masks for homosexuality. Some are so transparent that even an amateur will recognize them at a glance. A man marries a girl because he loves her brother; a woman marries the brother of a girl to whom she is homopsychically attached. (An excellent illustration of this is given in Stekel's fascinating book, "Nervöse Angstzustaende," Berlin, 1912, Case No. 93, pp. 188-196).

In this way the wife of a friend may become a source of great danger, and this love by proxy (or substitution) has been the cause of more than one tragedy. So too the transference of a (male) patient's love upon the physician's wife may be a manifestation of homosexuality.

The best known mask for homosexuality is *psychic impotence* which occurs most frequently in the presence of a woman of refinement and distinction. Men who are perfectly potent in the presence of prostitutes and are impotent in the presence of a lady are homosexual; their passion is aroused only by thoughts of the men with whom the *puella publica* has consorted. Although such impotence has also other determinants this factor is never missing. (A man may love a woman to such an extent

that he identifies her with his mother and he is impotent in her presence because of the prohibition against incest.—T.).

Only the careful study of the masked forms of homosexuality will enable us to understand the tremendous significance of bisexuality in our psychic life.

Those forms of homosexuality that are manifested in *phobias* and *obsession neuroses* do not need to be detailed here because they are well-known even to an amateur, especially if he be well-grounded in the basic principles of psychanalysis. Men who experience a feeling of uncanniness or fear when they are alone in a room with another man, or if a man walks up behind them, or who dream that a man points a revolver at them or advances on them with a drawn sword or a raised club, or who have a sensation as if a hard round object or a cylindrical stick were in their rectum, etc., betray their repressed homosexuality just as much as the paranoiac who believes himself persecuted by men. Women have similar phobias, especially such as relate to their maids and other female servants. Many women who are continually changing their female domestics, who quarrel with them on every occasion, or constantly grumble about them, or who permit themselves to strike them (the substitute for a sexual assault) are homosexual. So, too, some forms of *fetichism* signify homosexuality. A beautiful hand, a large foot, red ears, etc., occur in both sexes, and in the case of male fetichists serve symbolically to replace the woman's missing phallus.

The investigation of masked homosexuality is sure to further the cause of psychanalysis. Equally sure is it that the knowledge thus gained will arouse violent opposition in many quarters. It is quite possible that much of the general resistance to psy-

chanalysis has its origin in homosexuality. *What civilized humanity is least willing to acknowledge is its bisexual constitution.*

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## THE DIAGNOSIS AND TREATMENT OF MALIGNANT DISEASE OF THE BREAST.

BY

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In presenting this imperfect dissertation upon malignant disease of the breast, it will not be the intent or purpose of the writer to describe any new clinical symptoms or physical signs whereby an accurate opinion may be more quickly formed as to the dangers of mammary neoplasms, believing that the surgeon already has at his command a sufficient number if he were only allowed to apply them earlier. It is my earnest desire, however, to inculcate renewed determination to give the subject closer study, and to suggest education of the public along this line.

This is an age of preventive medicine, many of the former scourges of the human race having been shorn of their terror by adequate methods of prevention. This has been accomplished in two ways: First, by eliminating the cause; second, by educating the laity in a more thorough understanding of diseases, particularly as to cause and effect. In dealing with the cancer problem only the latter method can be utilized, since the cause is unknown. No one can dispute the statement that in cholera and yellow fever the agency of greatest assistance in limiting and controlling these two scourges has been education of the masses; and the

writer would earnestly suggest that similar measures be applied to cancer, i. e., education of the laity by starting a world-wide cancer crusade, explaining the facts in detail, and then awaiting results.

If it be true that (a) cancer is at first a local disease, subject to removal with lasting relief; (b) if it is alarmingly on the increase; (c) if neither age nor race is exempt; (d) if thirteen out of every fourteen mammary neoplasms in women over forty years of age will prove malignant, it certainly becomes the paramount duty of the medical profession to educate the laity concerning cancer, and particularly some of the earliest symptoms by which it may be recognized; or, at least, to instruct them that all tumors of the breast should be considered malignant until proven benign. The truth of these premises being admitted, if the women of this country can be made to realize what a tremendous responsibility rests upon them, not only as regards their own particular lives and happiness but in helping to lower the percentage of unfortunate cases that are yearly growing larger, they will have won the welcome plaudit, "well done, thou good and faithful servant."

Is such education needed? If the surgeons of the civilized world were assembled and the question asked, they would unanimously reply in tones of thunder YES! This is further emphasized by the fact that the surgeon not infrequently encounters cases in which the disease has extended far beyond the period where anything akin to a cure may be promised, and any operation undertaken is merely performed to rid the individual of a foul-smelling mass which is sending into her system toxic material and rapidly hastening the end, to say nothing of the odor and appearance of the ulcer-

ating surface which have to be endured by those whose tender care is extended to these unfortunates.

If the women of this fair land of ours would read that part of the Criminal Law which proclaims every one innocent until proven guilty, and would apply it to themselves in this wise "that every tumor in the breast is a cancer unless proven innocent," how closely they would watch themselves, and how quickly they would apply to the surgeon for relief, when they noticed an abnormal growth in the breast. There can be no denial that the clinical picture of mammary cancer has not only cast a gloom over the laity, but has also created a false impression in the profession. Can a permanent cure be effected if operative intervention be undertaken early and is sufficiently radical in character? This has been answered by men whose experience has been the largest. Rodman says that from forty to fifty percent should be fully cured when seen and operated upon early, to say nothing of the perfect cure in that thirty to thirty-five percent that are benign in the beginning. (Judd, in "*Mayo Clinic*," 1911, p. 214).

Every woman should be made to understand these facts, that (a) if she submit to surgical treatment within a few days after she first feels a "lump" in her breast, the chances are one out of three that the lump is not cancer and the proper treatment will yield one hundred percent of cures; that (b) if the "lump" is cancer her chances are one out of four that it is the least malignant form, with a possible chance of one hundred percent of cures; that (c) at the worst, with cancer in this stage, the chances are eighty-five percent. (Bloodgood, *Boston Medical and Surgical Journal*, Dec. 1st, 1913). Unfortunately, how-

ever, under present circumstances and conditions the laity do not know these things, and there are many physicians who do not; therefore, between the hopeful layman and the optimistic physician the favorable period for operation is oftentimes permitted to pass, and the patient applies to the surgeon too late. Of those presenting evidence of long delay, about one-half may be safely said to be due to ignorance of the people, the other half to advice given by the ultra-conservative physician who makes his examination before glandular involvement elsewhere has taken place and admonishes his patients to wait, to "not bother the tumor until it bothers them." If observed in the spring time, they say "let me see it again in the fall!" Such advice reminds one of the story of the young man standing on the edge of the vessel's deck tossing high in the air the precious pearl; once, twice he tosses, then misses his catch and the pearl is gone. Once such advice is given, the patient waits until "alas, the silver cord is loosed, and the golden bowl is broken!" A companion and mother is gone.

Listen to that sound and wholesome advice of one rich in experience, the late Dr. Maurice Richardson, who said that all neoplasms wherever situated should be removed if possible when first discovered. Again, quoting from Rodman (whose words should sink deeply into the hearts of every physician), "he who advises a woman with a tumor in her breast to wait is guilty of an unwarranted and censurable act." It is safe to say few women know that cancer in all its phases is second only to tuberculosis in the causation of death, and that it is rapidly increasing, that only a few more years will be required to place it at the head of the list in number of deaths each year, all ages considered, that of

women over thirty-five years of age more than one in five die of this loathsome disease.

What does it all mean? First of all, it means that every family physician is a very important factor, for upon him devolves the task of making the diagnosis or taking the patient to someone who can; second, it means the great need of compulsory registration of births, diseases and causes of death, for by this means only can we arrive at a correct conclusion of the frequency and location of disease; third, it means that when we, who style ourselves surgeons, see a tumor in a woman's breast we should excise and examine it thoroughly, instead of simply "watching it" as is so often done, for with the Warren incision it can be removed and practically no scar will be left. Then why wait when it is so well known that "procrastination is the thief of time?"

What are some of the clinical signs of this horrible condition which we all fear? The fact has already been intimated and the writer desires it be emphasized that any mammary tumor of whatsoever size or location, and regardless of the age of the patient, should be viewed with fear akin to terror! In making a diagnosis, examination of the tumor, the skin, the nipple and the axillary glands, together with the history of the patient, pain, etc., are the principal points mentioned by various authors. In some instances the history may be obtained with sufficient accuracy to be of service. The family history as to malignant tumors, tuberculosis, etc., likewise a tubercular lesion elsewhere in the body of the patient, should be considered, as the significance thereof may be of sufficient importance to warrant further investigation. Syphilis should also be remembered, and even in

the absence of a syphilitic history a Wassermann or cobra venom test should be made.

*Age.*—If the neoplasm occurs in a woman under twenty-five, the presumptive evidence is in favor of benign tumor. It must be borne in mind, however, that malignant tumors occur in those under this age. While in patients over twenty-five mammary neoplasms are generally malignant, the majority being carcinomatous, benign tumors are not impossible even in elderly women.

*Duration.*—The fact that a mammary tumor has been present a long time generally excludes malignancy, yet it does not necessarily follow that it will forever remain harmless. Palpable quiescent tumors have existed in the breast ten or even twenty years, then rapidly became malignant. My experience has been that too much reliance must not be placed upon the clinical history, but it should be accorded reasonable consideration in studying the symptom complex, always remembering that a positive diagnosis can only be made from appearance of the fresh tissues and frozen sections under the microscope.

*Position of the Neoplasm in the breast.*—It is a well established fact that most malignant tumors occur in the upper and outer quadrant, and next to this in the nipple zone. On the contrary benign tumors, except papillomatous cysts, are rarely found in the nipple zone. Mastitis of pyogenic origin occurs most often in the outer zone, while tubercular mastitis is observed near (or in) the inner zone. Carcinoma occurs in axillary prolongation in about ten percent of the cases.

Pain is not an early sign of malignancy, being far more common in benign tumors, and when present in malignancy is always a late symptom and therefore of little diag-

nostic value. Beginning cystic formation is frequently accompanied by sharp pain, so also is fibro-adenoma and senile parenchymatous hypertrophy.

In a few instances dimpling of the skin may be the first symptom noted by the patient, but in all such cases a tumor exists, and could have been detected some time before if careful examination had been made.

Discharge from the nipple, except during pregnancy or lactation, is usually symptomatic of benign tumor. If the fluid expressed is cloudy or bloody serum, it is almost pathognomonic of cyst with an intracystic papillomatous growth. Retraction of the nipple always means malignancy.

Enlarged axillary glands are of little or no diagnostic importance, since they never become enlarged until late, when the neoplasm itself can be easily seen and felt; furthermore, the axillary glands are so frequently enlarged from other causes that their presence adds little of clinical value.

In young women marked uniform enlargement of both breasts is pathognomonic of virginal diffuse hypertrophy, and if observed during pregnancy it means the same. Enlargement to any appreciable degree of only one breast signifies tumor formation and should be explored at once, and with rare exceptions will be found tubercular or carcinomatous. Unilateral atrophy in elderly women indicates a schirrhus, also in young women, unless associated with lactation mastitis. The following tabulated signs will materially help in formulating conclusions:

#### BENIGN.

Slow in growth; are localized and have definite capsule; and even when of large dimensions do not affect the general economy.

Movable, unless restricted by inflammatory products.

Do not metastasize nor become disseminated throughout the body, and are not fatal.

Are the tumors of youth.

15% to 17% benign.

MALIGNANT.

Grow rapidly; are diffuse; not encapsulated; quickly attain size and tell rapidly on the general economy.

Intimately connected to surrounding structures; are adherent and immovable.

Rapidly metastasize and disseminate by blood or lymphatics, and progress steadily toward a fatal termination by metastasis or by an autointoxication, commonly known as cachexia.

Found in women over 30.

85% to 87% malignant, and more than 75% of the carcinomatous variety.

As a rule sarcoma occurs as a single tumor of one breast; rarely are there multiple tumors or both breasts simultaneously involved. The rapidity of increase in growth also indicates sarcoma. A tumor developing in the breast during pregnancy or lactation is generally sarcomatous, and tends rapidly toward a fatal termination. Many sarcomata undergo cystic changes. When this ensues a discharge from the nipple is nearly always present, and it is not uncommon for cystic formations to increase rapidly and alarmingly in size due to hemorrhage. Any cyst in the breast should be viewed with suspicion and removed at once.

The following points relative to mammary cystic formations, etc., by Bloodgood are worthy of reproduction: If the cyst has a thin wall and is non-adherent, if no

hemorrhage has occurred within the cyst, and if the surrounding tissue looks normal, complete removal of the cyst with a small portion of the breast is sufficient. On the other hand, if the cyst contains a papilloma, the entire breast should be removed since at least fifty percent of papillomatous cysts are malignant at the base of the papilloma. Every smooth walled cyst containing blood is malignant. Cysts with thick walls, even though smooth and not containing blood, are usually malignant. In that condition known as abnormal involution, where at the point of incision the parenchyma is increased, numerous minute cysts and very small cavities filled with granular material are found, each and every one should be removed by the radical method, as they are prone to become carcinomatous. If the cysts are large and numerous they are generally benign, and may be removed by the conservative method.

Again, in sarcoma the lymph glands are seldom enlarged, and the breast tissue is pushed aside and atrophied. The cutaneous veins are early enlarged, and the overlying skin is thinned and pigmented, which is in sharp contrast to the infiltrated, thickened condition observed in carcinoma. The skin in the sarcoma is not adherent to the subjacent tumor, but often ulcerates as the result of thinning, and the ulcer when viewed closely will have clean cut edges, not adherent and through the opening will protrude a fungous mass. The body temperature in sarcoma is elevated, as is also local temperature in region of the tumor. Local recurrences and visceral metastasis are common in sarcoma, spreading by way of the blood stream. Cachexia, as stated by Borst many years ago, does not accompany sarcoma even though the growth is

ulcerating. Neither do adhesions of the skin occur, nor glandular enlargements take place.

Trauma, race, social status, fertility or infertility of the host, together with that nightmare of the laity, "heredity," should all be considered, and are of value only when they point in the same direction, but should never be regarded too seriously. When trauma is a factor in mammary carcinoma it is usually after the infliction of one rather severe injury, while in other parts of the body there may be a history of a number of mild injuries. Sarcoma follows one rather mild injury, not enough where bone is involved to produce a fracture. Rare indeed is it that both mother and daughter have mammary tumors. Rodman had only one such experience, but admits many such histories. Married women, and especially those who have become mothers, are more prone to mammary carcinoma than are the single or those who are sterile, due of course to the changes in the gland incident to lactation.

Before leaving this part of the subject I wish to add my voice to that of other clinicians who realize that in possibly ten percent of all cases mammary carcinoma is not and cannot be diagnosed clinically in an early operable stage. The clinical symptoms constitute only a part of the symptom complex, and to the microscope must all specimens be sent for an accurate and positive opinion.

In considering the treatment of mammary carcinoma, certain points stand out pre-eminently, viz.: (1) that we are today little if any nearer the solution of the cause than we were many years ago; (2) that the disease is first local and can be relieved if observed and properly treated early; (3) no one can influence the character of the

tumor; (4) any treatment other than thorough excision takes from the patient the only reasonable chance of permanent cure.

While surgery does not promise a cure in all cases, it does promise cure where the tumor was at first benign, which comprises about thirty-five percent. It even promises relief to patients with beginning malignancy if they apply for treatment early, and finally it extends the hand of palliation to those far advanced by removing degenerated and disintegrating tissues which are constantly sending toxic material into the system.

A long road has been traveled from the simplest botanical salve to the X-ray, radium, trypsin and amylopsin cure, to say nothing of the easy, safe and sure relief promised these unfortunates by the various fake cancer cure concerns whose principal stock in trade is the well prepared advertisement in newspapers that for the sake of a few paltry dollars are willing to sacrifice not only the money of their friends but human life as well. (Be it said to the honor and credit of the press that today our best papers refuse such advertisements). Not a single permanent favorable result can be reported from any of these so-called "cancer cures" where the neoplasm was positively demonstrated by the microscope to have been carcinomatous.

To the woman who subjects herself to immediate operation upon the discovery of a "lump" in the breast, her chances of cure are eighty-five percent, with a possible one hundred percent. If she delays until the surgeon can be certain that it is a carcinoma, her best chances are sixty-four percent if the tumor proves to be adeno-carcinoma, and in the more malignant form of cancer thirty-three percent. The danger of delay is really greater than this, for the

reason that the neoplasm may so extend that no radical operation can be performed.

The following report of Fidelen (*Archiv. Gen-dechir.* vol. iii, 999) is of more than passing interest: From 1865 to 1875, the percentage of cures was only 9.4%; 1875 to 1885, 10%; 1885 to 1895, 34%; from 1895 to 1905, 46.3%. The recurrences from 1865 to 1875 were: locally 76%, glandular 8.4%, at a distance 7.5%; from 1875 to 1885, locally 72%, glandular 6.2%, at a distance 10%; from 1885 to 1895, locally 45.5%, glandular 8.4%, at a distance 19%; from 1895 to 1905, locally 29%, glandular none, at a distance 23%.

It will be noted that, in the decade from 1895 to 1905, the percentage of cures was raised from 34% to 46.3%, local recurrences being lowered from 45.5% to 29%; and, in this connection, I wish you to remember it was due to American surgery that such results were obtained.

In 1895, after the splendid work of Cheyne, Butlin, Rae and others was given to the world, Halsted published his description of the complete removal of the mammary gland, pectoral muscles and fascia, together with the axillary lymphatics. It was about this time he made the memorable assertion that the man who makes the primary skin incision for removal of the breast should have nothing to do with closure of the wound, for the reason that in spite of himself he would plan to save skin close to the wound and in this very thing lurked the danger of rapid recurrence. The truth of this statement is now well known. In an analysis of more than four thousand cases Handley found that recurrence was nearly always in the skin and superficial fascia, and in this assertion Butlin, Cheyne and most others, including

the pathologists, now agree.

In completing the details of complete operation for removal of the breast no one deserves more credit than Dr. W. L. Rodman, whose method has embodied in it those principles of wide dissection of the fascia enunciated by Halsted. At the same time he controlled the hemorrhage by getting first to the proximal part of the vessels supplying the glands. Also, by cleaning out the axilla first we destroy the chain of glands leading toward the neck, thereby lessening the danger of cancer being disseminated from the primary focus. Rodman's operation can possibly be improved upon by saving all of the pectoral muscle except the aponeurosis and fascia covering the pectoralis major and minor. The latter should be removed, for it is therein that the lymphatics extend and the cancer cells disseminate. Rare indeed is it that the muscle itself is found implicated. The late Dr. Joseph Price called attention to this several years ago, and many others (Handley, Carwardine, Henle, Murphy, et al.) save the muscle, and by pulling it into the axillary space use it as a cushion for the blood and lymphatic vessels, thereby lessening the edema so often observed.

A word in regard to the various operations devised by surgeons with a view to closing the wound: They do not remove enough of the skin and superficial fascia. It is far better to leave the wound open and employ skin grafting.

Let me say in conclusion that we can offer the patient a primary mortality of not more than one-half percent; that the percentage of cures will be in direct ratio to the time the neoplasm has existed—in early cases at least fifty percent. Isn't it worth while?

## IT'S A LONG LANE THAT HAS NO KINK.

BY

WALTER M. BRICKNER, M. D., F. A. C. S.  
New York.

(With Apologies to Montague Glass.)

"Vot did I told yer, Mawruss, ven you made me ve should engage for cutter that *schnorrer*, Ike Nechamkin, which he is your wife's brother-in-law a cousin. For a month everything goes fine, like a new broom sweeps quickly. And now *schon* three weeks already, just 'cause his wife is sick on the hospital, understand me, the cutting room is all fives and sixes, y' understand, and *oser a stück* work is he doing."

"Seemingly, Abe, a husband's feelings you don't got it, it seems. And a partner's feelings—the least said, the soonest heard."

"Partner's feelings is something else again, Mawruss, which it ain't got with Nechamkin nothing to do at all. Three afternoons a week he starts in the morning on the Madison Avenue car up to the hospital. And when he is here, understand me, mostly he is hanging by the telephone or talking on the operators about his troubles, y' understand. I got sympathy fer him, Mawruss, but a little goes better as a feast. Here we get it today a letter from Herman Margolies of the Elite Clothing Emporium why we don't deliver them 3657's and that *roscher* Nechamkin ain't even through cutting 'em yet, understand me. I tell you, Mawruss, business is business."

<sup>1</sup> Montague Glass' clever stories have been so universally enjoyed, even by those who understand but few of the expressions used, that we are certain the readers of American Medicine will thoroughly appreciate this bright paraphrase read, with some elisions, by Dr. Brickner as toastmaster at the recent banquet of the American Medical Editors' Association, June 23, 1914.

"Sure, I know, Abe, business is business. Also sickness is sickness, Abe, and just because Ike is only a cutter, also he could have sometimes a little sickness, too, *verstehst du*. As dull like a serpent's tooth is a bad memory, Abe, and seemingly you forget that you couldn't do no business, neither, a year ago, when your wife was sick on the *mappel*.<sup>2</sup>"

"When my wife has it a *mappel*, Mawruss, what has that got it with Nechamkin anything to do?"

At this point in the discussion, the office door was thrown open and the cutter himself, wild-eyed and dishevelled, burst into the room.

"You must excuse me, gentlemen, but I can't stand it no more, I can't stand it no more!"

"What's the matter now, Ike," said the partners in a breath.

"I can't stand it, I tell yer. *Schon* three weeks is my Rosie on the hospital already, and she isn't any better, and they don't seemingly know what is it at all. I don't kick I got to pay all her expenses, but, *Gott weiss*, for \$7 a week also they could give her more as hard boiled milk and slime water, understand me. When she went to the hospital, the doctors said she had it either on the kidney something *oder* in *magen a geschwir*, so they put her in the medicines ward. Everyday came a big professor, and another professor, and another doctor which she thinks maybe he isn't even a professor; and they examined her all over. Everyday *auch* a bunch of students, some of them in white suits, y' understand, also examines her all over. Also they look at her blood, and in her blood it is nothing. They take

<sup>2</sup> Referring to a previous "Potash and Perlmutter" story.

her upstairs on x-ray pictures and they say on the kidneys it is nothing. Then they put in a tube in her stomach, and they say on the stomach is nothing. So they let her she could eat some fish, and the next day she is all over great big red spots, like that design for the 6943 waist, Mr. Potash. So they move her into the ward for skin sicknesses. One skin professor said it was one thing, and another said it was something else again, and the other

somewheres else again. I can't stand it no longer!

"Everyday I telephone up 'I want you should tell me how is Mrs. Nechamkin?' and that fresh girl by the switching-boards she says, 'she's doing as well as can be suspected.' How I should know what should be suspected!"

"And now they want to move her in the cutting room and make tomorrow operation! I can't stand it!"



"The other said it wasn't what anybody thought it was and what did they think it was anyhow?"

said it wasn't what anybody thought it was and what did they think it was anyhow? So they moved her into another room where she got it three new professors on nerves, and another one of those students which he is dressed up white like a street cleaner. They put electric lights in her eyes, and stuck pins in her feet, and put a great big skewer in her backbone, understand me. Then they say it was anyhow nothing worth while, she should go back in the medicines ward. I give yer my word, Mr. Perlmutter, every time I go up there she's

"Tht, tht, tht," clucked Abe and Mawruss in chorus, "and what do they want to make operation on, Ike?"

"That's just it, Mr. Potash. I asked the house doctor what for operation they should make, and he says, 'exploratory.' What does it mean, 'exploratory'? I looked in my dictionary on every word beginning with 'X'."

"There, Mawruss," said Abe, "didn't I told you he ain't got no education! 'Exploratory' don't begin with an 'X', Ike; it begins with an 'a', like 'expanses' and 'explanation'."

The next few days things went from bad to worse in the cutting room but after that they gradually improved, as Mrs. Nechamkin progressed beyond the fear of danger from the operation, and little by little began to feel no more miserable than she had been before it. It was quite two weeks, however, before the head cutter had reached that state of poise in which he could properly attend to his work.

"Well, Ike," said the sympathetic Perlmutter one morning, "it's easy to see you got it your wife home again, ain't it?"

"Yes, Mr. Perlmutter, in a way I have; and then again in a way, I haven't, understand me. When Rosie comes home she is all covered with plasters and towels and bandages and she has a piece paper she must go on the dispensary they should heal up the hole in her skin. So three mornings a week, she goes down to one doctor he must change her bandage, y' understand; and three afternoons she goes on another kind of doctor he gives her medicines and electricity und *gott weiss noch*."

"Anyhow, Ike, what was it your wife's sickness?"

"I can't think of the name, Mr. Perlmutter. I can't think of the name."

"Never mind the name then, Ike, so long she's getting better again, ain't it?"

"No, Mr. Perlmutter, better I couldn't say she is. She has always the same *margenkrämpfen* and *kreitzschmerzen* like she had it before, understand."

"Is that so? Anyhow, she will get better, Ike. It's a long lane that has no twist."

"That's the name, Mr. Perlmutter. That's Rosie's sickness: a Lane Kinking."

"A lame kinking? I never heard of it, Ike. But if it's anything catching, don't tell it to Potash the name or he'll right away want we should fire you."

"I won't say nothing, Mr. Perlmutter. Also, don't say nothing to me about that hospital. It may be all right for these here foreigners, understand me, but *Gott behüten* when I should be sick, rather I would take chances by my old lodge doctor, which he ain't a professor, *verstehst du*, and he is easier satisfied I mustn't have one of them new diseases."

## A LETTER FROM OUR OLD FRIEND DOOLEY.<sup>1</sup>

BY

WALTER M. BRICKNER, M. D., F. A. C. S.,  
New York City.

(With Apologies to Peter F. Dunne.)

'Twould be the proudest moment of me loife if Oi could be wid yez on the night of the iditors' banquet.

Only yesterdy I said to Hinnissey: "Hinnissey," I says, "Have yez ever thought phwat a calamity it would be if all the docs would shtop readin' thim midical journals? Do yez know," I sez "that we'd all git will of only old-fashioned diseases, instid of dyin' of new-fangled ones?"

Oi have the gra-atest rayspect for the medical profeshun. Anny toime of the day or noight, d'yemoind, when the ould woman comes home sick from one of thim tango teas or tays *dansants*, as they call 'em, Doc is Johnny-on-the-shpot to tell me for \$2 that I did all that was nicissary when I giv her ipecac an' a mustard plaster. But its you iditor fellows I musht take me hat off to. Without yer books and yer midical magazines the risht of the profishun wad be nowheres at all at all. How the divil wad the nerve docthors and the shkin doch-

<sup>1</sup> Read at the banquet of the American Medical Editors' Association, June 22, 1914.

tors be arnin' a livin' today if they hadn't read in the journals about 666, or phwativir the number is, Oi don't know?"

I says to Hinnissey: "When ye go to doc wid yer complaints," I says, "he writes them all down and thin he looks them up in his journals to see if they's regular and accordin' to the rules of the union. Maybe he foinds an article by another doc on the same symptoms, like this d'yer moind:—

'In the *Chinchinnati Fancy-Finical*, Schmittberger and O'Flaherty dayscribe a raymarkable case of anaphylaxis from the eatin' of harrd boiled shrimps, in which the symptoms were similar to those in the case rayported below. Their observations open up an entoirely new field, etc., etc.' New fields, Hinnissey, is one of the favorite things in midical literachure—and some of them, d'ye moind, is elaborately decorated with tombstones.

"Suppose, for instance, Hinnissey, I've been mixin' it up with one of the bruisers here in the saloon, and we've wiped up the flure wid aich other, d'ye moind. When the scrimmage is over I crawl up to the doc's. 'Doc,' I says, 'I have a hivvy pain in the pit of me back,' I says, 'and me right knee is thremblin, an' the room is goin' round and round, an' devil a bit can I see out of me lift oi, an' I can't get me brith an'—"

"Shtop," says doc—"I rade all the midical journals and there ain't no such symptom-complex."

"An' phwat is a symptom-complex, Oi don't know," says Hinnissey.

"Phwat diffrence does it make, Hinnissey, as long as I haven't got it."

Then doc says, "Dooley, aither ye're lyin' to me or ye've got a bran' new disease an' I'll have to write ye up. But first and

foremost I must take yer blood prishure," he says.

"Ye'll take nothin' of the sorrt," I says, "I can't do widout it," I says.

Onnyhow six months later there Oi am, all printed out in *American Midicine* of the *Journal of Insobriety*:—

"M. D. (that's me, Maartin Dooley), aged 56, a saloonkeeper, but otherwoise of bad habits, was rayfirred to me by Dr. X.—(They always put that in Hinnissey), wid the followin' histhry:

*Family histhry*.—Faather died in infancy of cerebral adiposity. On the maternal side, his aunts and uncles have idiocy, epilepsy, rickets, schurvy, and Potter's disease of the shpine, but are otherwise in parfict hilth.

The patient himself is entoirely married and has three hilthy childrren (bless the darlins' haarts). He has had mumps, measles, and malaria, dyspepsia, dysenthy and delirium tremens.

*Prisint histhry*.—Whoile considerably dhrunk wan of his friends hit him in the fallopian tube with a bungstarter . . . . .

"An' so it goes on. The wander of it is, Hinnissey, when ye rade these biographies, that ye've lived as long as ye have—if ye have lived that long.

But to the docttors, Hinnissey, every little ailment has an interest all its own, an' doc wad gladly pay ye for the plishure of raymoving yer kiddie's tonsils, if it was his hundredth case, so he could hustle them all to the midical journals."

I'm sorry for you iditors. Ye have to rade all ye publish in yer journals—the which is more than yer subscribers iver do. Wid me profound sympathy,

Yours truly,

MARRTIN DOOLEY.

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# THE ANNOTATOR

**Shall We Eat a Big or Little Breakfast?** This question is worrying a lot of people, but it is quite likely that not one of them will change his own habits in the least, no matter what he reads against it. There is no question that growing children need considerable nourishment at least three times a day.



When it is set before them in attractive form they eat like the dear little pigs they are. That is they eat until they can eat no more, when they stop with a contented sigh and forget it. An adult who leads an active outdoor life has about the same needs as a child and unless he eats liberally he, sooner or later, gives evidence of undernutrition if he does not break down entirely with tuberculosis or nervous exhaustion. There seems to be no question also that much alcoholism is due to underfeeding. When cold weather comes on, it is amazing how much food is consumed by hard workers such as lumbermen. On the other hand, where there is little need of fuel by sedentary and indoor workers, it is equally amazing how little is required. We are often incredulous as to the small amount of food habitually eaten by very old people. If any of the hearty outdoor workers takes up a less active life and continues his dietary habits, he soon lands in the doctor's office. All this is so old and trite that we are almost ashamed to write it, and yet it is necessary to repeat it now and then, particularly in emphasizing the fact that as a rule the sedentary worker finds that he is infinitely better off with a very light breakfast. The continental sedentary upper classes of Europe seem to have settled down to the traditional coffee and rolls, but the outdoor living Englishman must have his bacon and eggs. Both are right. As for the usual run

of business men, writers, etc., a light breakfast seems imperative, and a light lunch if there is afternoon work. The main meal must be after the day's work is over for much food induces mental sluggishness and—contrary to popular tradition—a good night's rest.

**Our Dreadful Murder Record.**—This was recently emphasized by Mr. Frederick L. Hoffmann in *The Spectator*. We have frequently mentioned the same facts and the situation seems to be getting worse instead of better. It is largely a matter for psychologists to explain rather than psychiatrists, for there has been no question as to the sanity of the vast majority of our murderers.



It has often been noted that the murder rate in the northwest corner of Europe is the smallest in the world. London in spite of its slums and criminal spots has a rate of about one murder in 100,000 population. The rate increases to the south, so that Sicily and the adjacent parts of Italy have long been credited with the least regard for life of any other place in Europe. The north of Italy is so much better that the rate for the whole Kingdom was but 3.9 in 1910, while in the United States registration area it is 5.9. Our south has a dreadful record probably from the black population, the average for the cities being 20.2, while Memphis yearly murders 64.3 for every 100,000 population. The names of our northern murderers generally indicate a racial origin in the south and east of Europe and leave little doubt that our bad record is largely a matter of race. Still, there is no use in getting pessimistic over it, for it can be remedied. Worse things than that have been cured. The main

fault is not entirely with the medical profession now, for our alienists are showing more and more reluctance towards being used as cat's-paws to keep murderers from execution. The main fault is in a judicial system which permits long delays and eventual escape to those who can hire lawyers to take advantage of our chaotic laws. Mr. Taft has frequently mentioned the scandalous delays of justice which finally amount to denials of justice to outraged society. The bar associations are exerting themselves to simplify procedure, eliminate non-essential technicalities and prevent delays. It does seem, that though the matter has little relation to medicine, yet the profession could do a lot towards extending the idea that a murderer must be executed or put where he cannot repeat the offence. Murder will probably never be eliminated but it will be very rare when everyone realizes that he will die or spend his best days in custody if he destroys a fellow man. The French seem to justify women murderers but perhaps the Caillaux jury thought that she had been shabbily treated by the man she killed. Conviction is difficult among emotional nations, and such murders do not occur among the quieter British. We have several problems ourselves.

**Playing Cards and Infection.**—Influenza spread by playing cards is the latest of the vagaries of bacteriophobias. Some

French physicians, who are evidently trying to scare their wives into abandoning bridge whist and staying home, are industriously circulating the base rumor that there will be a dreadful epidemic of grip this winter from the contagion

deposited on the cards by one player and passed on to the next person who handles them. We rise in protest against this nefarious effort to use sanitation for the base purpose of reforming the part of humanity which is the better half already. When a husband needs a quiet rest and cannot leave his business, we do not mind recommending his talkative wife to take a trip to Europe to avoid a smash-up. The means sometimes justify the ends of cure, but we protest against this new effort to



scare women into staying home. As for condemning the whole bridge-deck—never. It is like the old charge against books of circulating libraries, and the proposition to disinfect them after every return. The chances are that even if there were a disease present and a few germs stuck to the book, they would all be stone dead in a few hours or so attenuated as to be harmless. We get diseases from "carriers" as a rule and not from things. There is a great danger in assemblies therefore, in times of epidemic respiratory diseases, for it is very easy to have the germs coughed into one's face. Paris seems to be a hotbed of influenza every winter, and its social assemblies seem to be the means of spreading the infection—not the cards.

**Convicting the Fly.**—The common house fly has been so often caught in the act of transferring disease from the sick



to the well, that it seems a waste of time to prove it any further. Yet we must remember that there are millions of people who have never heard of it. Dr. Donald B. Armstrong must therefore be given great praise for bringing the mat-

ter home to a community of Italians in the Bronx. By screening all the houses in a certain area, and teaching the residents by moving pictures and otherwise as to the dangers, he caused a marked reduction in the summer complaints of infants as compared with an equal area not so protected. (*Jour. Amer. Med. Ass'n.*, Jan. 17, 1914). This is the kind of work needed all over the world, for only in this way can we convince people of the dangers lurking in the breeding places. The campaign against manure heaps in cities cannot be efficient unless the people know enough to support the health authorities. The people must learn that the decree of banishment has been issued and the fly must go. There are only two ways of doing this—abolishing their breeding places and starving to death the few which come from places overlooked. The gospel of cleanliness can not be preached too often. We as a profession must be the sermonizers.



**Technique of Ether Dressing.**—It is not generally realized that ether is valuable as a local antiseptic, says a writer in *The Nurse*. Owing to its remarkable power of penetration it will find its way into the deepest parts of any wound or cavity; where the liquid does not penetrate, the vapor of ether will find ready access. This makes ether an ideal antiseptic for use in all places that are not easily cleansed by the ordinary processes. In burns, felonies, extensive wounds, compound fractures, erysipelas, and all suppurating lesions, it has been used with very satisfactory results. The formation of pus is promptly arrested and healing advances rapidly under the local influence of ether. It must be understood that ether causes acute pain when applied to tender or sensitive surfaces, like a fresh wound, but the pain soon gives place to local anesthesia which lasts as long as the drug remains in contact with the surface. Sometimes this treatment has been known to cause a slight general anesthesia, tending to produce sleep.

As ether is extremely volatile, quickly evaporating from the normal skin, it is necessary to apply the dressing rapidly and use particular precautions to keep it from wasting away. The *New York Medical Journal* describes the technique used successfully by Durand, of Paris, as follows:

The dressing, after the very careful cleansing of the lesion and the neighboring skin must be prepared hastily and be so applied as to extend considerably beyond the edges of the injured or diseased area. It should also be made to adapt itself as intimately as possible to the tissues, after being freely saturated with ether and covered with non-absorbent cotton—since absorbent cotton greatly aids evaporation. The whole should then be protected with an impermeable covering of some sort. The edge of this covering being applied with some degree of tightness either by a special bandage, adhesive plaster, or any other means which the shape of the affected region will allow, the evaporation of the ether will be prevented, and its antiseptic action centered upon the exposed tissues. Such a dressing may conveniently be left *in situ* five or six days, when the wound will be found clean and undergoing resolution.

**Liquid Paraffin in Digestive Therapeutics.**—Manquat (*Journal des Practiciens*, No. 20—'14) insists on the necessity for using the pure oil only. To avoid borborygmi, intestinal pains, and a feeling of heaviness in the stomach, it should not be taken soon after a meal. It delays the complete emulsion of digested fats,

and stops the action of ferments. The doses should, therefore, be taken some time after meals. Manquat states that liquid paraffin acts upon the intestinal mucous membrane by lessening inflammation, quieting its changes, and reducing gastrointestinal intoxication. For habitual constipation, two teaspoonfuls should be taken on waking, two at 11 a. m. or at 5 p. m. and two at bedtime. In chronic and in tuberculous enteritis, the following has been used with success:—

Rx Pulv. Bismuthi Subnit.	.....	3 <i>ii.</i>
Paraffini Molis	.....	3 <i>ss.</i>
Paraffini Liquidii	.....	ad 3 <i>x.</i>
Misce.	Flat mixtura.	

The dose of this mixture is the same as that of the pure oil. It may be used in the treatment of hyperchlorhydria and of ulcerative gastroenteritis.

**Anesthesia Without Anesthetics.**—A stomatologist at Marseilles, Dr. Achard, has imagined a curious method for extracting teeth without pain. He tells the patient to breathe rapidly and deeply for one minute. After this lapse of time, the tooth can be removed without pain. The anesthesia lasts ten seconds, a time quite sufficient for the extraction. *Se non è vero è ben trovato!* In any case the method is simple and worth a trial.

**Dyspepsia and Bromide of Sodium.**—According to Dr. Leven, quoted by *Med. Press and Circular*, dyspepsia and its consequences are due to hyperesthesia of the solar plexus, hence he has employed in the treatment of that common and troublesome affection bromide of sodium as the best sedative of this form of gastralgia. Conjointly with carbonate of bismuth, the salt gives relief independently of all other treatment.

Bromide of sodium exercises its action on various painful gastric symptoms, and can be prescribed with excellent effects in all lesions (ulcer, cancer) of that organ. It acts on hunger pain as well as on spasm of the pylorus, on the painful sensation felt after ingestion of food, as well as that ascribed to hyperchlorhydria. It is a powerful modifier of all spasms localised to the digestive tract—pharyngeal, esophageal, gastric, intestinal. These spasms exist without any lesion, and are frequently due to flatulence and constipation.

The bromide is prescribed as follows—

Bromide of sodium	.....	5 drs.
Water	.....	10 oz.

a tablespoonful in the middle of the two principal repasts where the gastric spasms or lesions require prolonged contact of the salt with the mucous membrane of the stomach. If, on the contrary, it is advisable to act on the nervous system in general, it is preferable to give the solution in a little water half an hour before meals, so that it may pass though the stomach as quickly as possible. The bismuth is given between meals in drachm doses.

Bromide of sodium, when chemically pure, is well tolerated by the stomach, and has no noxious effect on the cerebral functions.

# American Medicine

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PUBLISHED MONTHLY BY THE AMERICAN MEDICAL PUBLISHING COMPANY.

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Complete Series, Vol. XX, No. 9.  
New Series, Vol. IX, No. 9.

SEPTEMBER, 1914.

\$1.00

YEARLY  
in advance.

**The superficial causes of the European war** have been recently described in thousands of formal articles and letters to the newspapers, but they all mention the matches which ignited the blaze and not one has described the collection of the material to be destroyed. The desire for trade or more territory has been mentioned, but the underlying universal overpopulation in every part of the world is not suspected. Indeed the possibility of getting more food in the distant future from the waste places of the earth has blinded not a few to the fact that time is required. Surplus populations need food at once. The world can produce food for far more people than it now feeds—indeed that has always been the state of the world and always will be—but that does not alter the fact that in any one period it does not produce enough for those then existing, and that there must be a struggle for existence. The best win and the inefficient tenth must be occasionally or always underfed. They are the ones to die of diseases due to undernutrition. The tuberculosis toll largely comes from this class. No one seems to realize the terror in England at the prospect of any nation interfering with the food streaming to them from all over the world. No one seems to know the imperative necessity for such streams of food into the continent where horses and dogs are slaughtered for con-

sumption under governmental supervision. The cry is for more room, and it differs in no way from the cry of primitive Aryans for "land," "land." They poured out in search of room and got it where they could. Professor Charles W. Elliot dimly sees this, but makes the foolish suggestion that Americans believe that "peaceable extension of territory and trade will afford adequate relief." This is amazing in view of our long record of forcible expansion without the consent of the Indian inhabitants. Idealism is running mad. We must face the fact that unrestricted childbearing only furnishes food for bullets in the long run. The religious orders which have been crying out against limitation of offspring are partly responsible for the war which they now denounce. Nations once proud of their high birth rates, are wondering where the food is to come from now that migration has checked by filling up the unoccupied places of the earth, and they cannot sell manufactures to buy food. We must remember that in the fifth century the Goths forced by starvation from the region south of the Baltic, moved across what is now Belgium, Luxembourg, Alsace and Lorraine and "ravaged France with fire and sword." The Vandals were of the same race and destroyed everything in reach. Fifteen centuries do not change man's nature—evolution is counted in hundreds of millenniums.

We will fight with chipped flints if we cannot get howitzers.

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**Attacks upon sociology** were quite frequent a few years ago and are now bound to be renewed on account of its utter failure to explain war or predict the present conditions in Europe. What should be the highest of the biological sciences has been denounced as no science at all, but a mere collection of group phenomena having no known relation. What is far worse is the fact that such sociologists as Scot Nearing, University of Pennsylvania, and Charles Elwood, University of Missouri, not content with ignorance of the biologic laws governing human activities, have ridiculed the application of natural law to social phenomena. Our sons are not being taught the truth. No alleged authority and no text book in this branch of science seems able to grasp the significance of the phenomena he has studied. They all speak of the elimination of poverty and war as though it were a possibility, and they all think that an increased birth rate is desirable though that is the only sure means of increasing poverty and causing war for trade and food. All human phenomena are mere variations of what we see in the lower animals. It would be far better then to make sociology a branch of zoology than the present system of considering it as something supernatural with laws of its own or even lawless. If sociologists who have been ridiculing Malthus for alleged unfulfilled predictions will only read him over again they will find that the present horrors in Europe surpass anything he imagined. The utter ignorance of biology which curses so much of sociological literature is the reason why so few

of the writers are able to appreciate Malthus' really wonderful generalizations. Even he could not see the full significance of what he found. The process of evolution was unknown. He could not have foreseen that overpopulation was the basis of advancement through a struggle which slaughtered the unfit. Those who denounce war would be in better business to find the reasons for it. Men are animals and act like dogs when some one attempts to get the bone they are eating. The possession of brains only causes a more intelligent fight and a more effective one perhaps, for survival goes to those who are able to survive.

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**The medical aspects of the European war** cannot be studied for some time as the conditions are so different from prior campaigns. Never before have so many soldiers been massed, and though typhoid and dysentery increase with crowding, the danger may be minimized by the greater attention now given to sanitation. No one can predict the outcome. We have heard rumors of the spread of smallpox, cholera and plague in the Balkans, but these are not to be anticipated in northern Europe. There is very little likelihood of any great discovery being made. The Manchurian campaign left the science of medicine where it was at the beginning. War is not the time for creative work which requires quiet, leisure and abstraction, yet Paris already reports an improved way of getting X-ray pictures very quickly. Surgery is not likely to be greatly enriched, unless it be in the direction of simplifying surgical technique in ordinary wounds and complicating it in others. The Spanish-American war left one legacy; bullet wounds of the intestine were

better off with no treatment than with bad treatment. They require such exquisite attention to aseptic detail, that they must not be touched except in a thoroughly equipped operating room which cannot be improvised in the field. If the cases are not moved from the battle field but are kept absolutely quiet, there is a fair chance of recovery depending upon the extent of the lacerations. The Japanese-Russian war also gave us one lesson and that was the quick recovery after wounds, particularly those of the small rifle bullet. Seventy-five percent of the injured were back in ranks in three months. Already we hear that soldiers disabled at the outbreak of war began returning to the army in three weeks. It seems that the percentage of recoveries has been increasing in every war, and the result is due to aseptic surgery and the comparative mildness of modern gun shot wounds. A mere aseptic pad on the wounds of entrance and exit with a bandage may be all that is required unless an artery is cut, and that is a rare accident. The percentage of combatants killed has been lessening for many centuries but the appalling casualty lists so far published may tell a different story in this war. We hear for instance that the new shells explode so violently as to kill all in a radius of twenty yards or so, by the mere concussion of the air.

**The proportion of deaths by disease and gunfire** gives no possible indication of the effectiveness of war sanitation. A short war may be very sanguinary but not give time for infection to spread. Moving troops are healthy because they run away from their own poisons. A long war with long periods of inactivity begets disease from soil and water pollution. In the Spanish-

American war, there was only one battle and that was a mere skirmish as fights now go. Ninety-five percent of the soldiers were never shot at, in fact many never got out of camp. Hence there were far more deaths by disease than by bullets. The Japanese shortly after had an aggressive war in which every soldier was shot at many times, and there were more deaths by gunshot than disease. Dr. L. L. Seaman of New York erroneously assumed that this small percentage of disease deaths meant better sanitation, and the Japanese allowed the error to spread to conceal their real loss. The delusion has become so fixed in the lay mind that we still hear it, though it has been repeatedly proved that Japanese sanitation was bad and their disease losses greater than ours. They campaigned in a healthy cool country and we in the unwholesome and infected tropics, and they should have had better results than ours. Russian losses by disease were far less than the Japanese. At the present writing we have heard of few deaths by disease in the European war, but of many thousands of deaths by bullets. According to Dr. Seaman's rule the sanitation must be superb if such a small percentage of deaths are due to disease. Nevertheless, we are beginning to hear of disabling rheumatism from lying in water filled trenches, and enormous numbers of infectious diseases including dysentery as though they were unpreventable. When this war is over, it is certain that we will not be so ashamed of our Spanish war record as we have been in the last sixteen years. The camp typhoid was checked by the use of appliances utterly impractical in campaign. The European soldiers are quartered in houses wherever possible and sanitation is guarded by very able men, but this may

fail after all. The Japanese were surprised at Dr. Seaman's praises of their "superhuman" work, and they skilfully used him for the effect on the enemy, and it probably deceived the Russian government into ending the war just when the army became strong enough to take the offensive.

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**The Red Cross organizations** play a varying role according to the country. In armies having no well equipped medical corps, the whole work of caring for the wounded is turned over to the Red Cross, but other nations prefer not to be bothered with women who require so much more care and protection than soldier-nurses for the amount of good done. Besides all this, no Red Cross organization can get to the places where the wounded are so long neglected. If the battle line advances it is safe to reach them, but by that time they are being cared for by the soldiers. After the disabled are taken out of the field of operations and properly bedded and housed, the work of nursing begins, and in Europe this has been done largely by religious orders and volunteers. The numbers required are so stupendous that the central government cannot control the work which is necessarily left to private or municipal initiative. The Red Cross detachments sent over from here are only a drop in the bucket. Neutral nations simply cannot afford to relieve all the distress even if it were possible to do so. This war has already shown that many recoverable wounded must die of unavoidable neglect where no human agency can reach them. In former times they were abandoned even when it was possible to help them. The Red Cross was organized to save as many as possible but the armies themselves do this now-

adays in order to get the wounded back in the ranks. The Red Cross is being relegated to the remote rear, and preferably for cases which cannot do any more fighting.

**Distrust of neutral Red Cross organizations** has become very prevalent in recent wars, in spite of all the good they do. They have harbored spies, partisans and immoral persons. The British in South Africa allowed a Chicago detachment to go through the lines to the Boers, but later caught some of the men fighting in the ranks. On the other hand an English neutralized corps has been recently returned to England by the Germans. Great nations are invariably offended by offers of help from neutral countries, for there is an implication that the warring country is unable or unwilling to care for its own. France has recently notified the world that she wants no more neutral Red Cross nurses. Besides all this alien workers require special care and protection. Our well meaning women proved a source of embarrassment to the Japanese government ten years ago, as they required extra food and attendants needed by the sick. In due time and in a courteous way it sent them back. Our detachment is commanded by an army surgeon, and this may ease its way somewhat, but will make foreign nations feel that we are violating neutrality by sending part of our regular army to patch up soldiers who will return to the ranks. A wounded man cured by neutral means ought to give a parole not to fight again but he doesn't. Neutralized hospitals, therefore, though intended to ease up the horrors of war, have a tendency to prolong the struggle and increase the suffering. It would be far better to use the contributions for the relief of Americans in distress due to the war. Charity begins at home, and

the Red Cross has shown that it is invaluable in that line. There is much praise bestowed on volunteers on account of their good intentions but that must not blind us to the fact that they are often unwelcome, and are neglecting home distress which Heaven knows is bad enough already. There is need of American surgeons in the American hospital in Paris, but that is an institution built and managed by Americans for Americans and now taking in sick and wounded of all nations.

**The Geneva convention** has long been found to be absurdly impractical in other ways and commanders must ignore it. The Red Cross flag is no protection whatever. No plan can be changed because a hospital gets in the line of fire. To save it might lose a battle, yet we can rest assured that the newspaper stories of deliberate firing upon the hospitals are not correct. The warring nations are composed of the same races as ourselves and are equally humane and intelligent. Similarly if a battle can be won by using the Red Cross vehicles to bring up guns and ammunition, no one hesitates. Nothing can be reserved for the use of the disabled to the exclusion of the fighters' welfare. If an ambulance can be seen, the enemy must conclude that it is up to mischief. If a hospital harbors guns it must be fired on, yet the old brutality to the wounded has entirely disappeared. The Geneva convention was devised to end them and has succeeded, because it was an expression of universal humanity protecting against past methods. The new order of things would have come in time without its influence. Commanders now as then obey its provisions when possible and ignore them if injurious. Wars are recognized as national. The opposing soldiers have no per-

sonal animosities and are invariably friendly when thrown together as helpless prisoners. We must also reject the stories of brutal treatment of women, and children. There are some scoundrels in every large body of men, and these will break both civil and military law when they think it safe to do so, but commanding officers invariably make short shift of those who are caught at it. Similarly it would be exceedingly unwise to form any judgment as to the reasons of military measures. Each side invariably puts a sinister interpretation on what the enemy does. For its own conduct, it has reasons which are good and sufficient, to its own mind at least.

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**The explosive effect of high velocity bullets** has been forgotten by those who are accusing one or the other combatant army of using cruel and forbidden ammunition. The old slow moving bullet ploughed its way through solid tissues, tearing them apart and making a rather extensive lacerated track. The new bullet acts something like a punch because it moves so quickly that the tissues in front of it are torn off before they can impart motion to the surrounding material. It is like the phenomenon of a bullet making a hole in a pane of glass or of firing a tallow candle through a wooden door—experiments described in elementary mechanics. The flesh wounds of the modern bullet are therefore clean cut, devoid of bruising or laceration and heal quickly and kindly. This has given rise to the idea that it is invariably benign and humane. As a matter of fact, when it strikes an organ full of fluid, say the bladder, or semi-fluid like the skull, its effects are almost devilish. The organ actually ex-

plodes. The reason is quite simple. The fluid is incompressible and the bullet must move all aside to get through. It imparts its own energy and velocity to the parts it meets, and these instantly transmit the pressure in all directions. The whole mass moves outward from the path of the bullet exactly as though a bomb had exploded. The bladder is torn to pieces and the skull shattered into fragments. For similar reasons the bullet will go through the soft head of a bone like a needle through cheese, but it may splinter a hard bone and each splinter becomes a projectile which tears its way through the soft parts. All this has been repeatedly explained (*New York Medical Journal*, Ap. 30, 1898) but seems to have been forgotten. Experiments have been made on tin cans and wooden boxes full of fluid and the containers are invariably shattered. There is of course a vacuum behind the moving bullet, or rather a cavity filled with vapor of water. After the explosive effect is over, the inrush of air will cause the container to collapse. This happens whether it is sealed or not. The explosive effect is never seen at long ranges where the bullet has lost its velocity. The nickel covering of the bullet is sometimes torn by a hard bone and the lead flows out. These deformed, mushroom-like bullets have given rise to the accusation that soft-nosed or dum-dum bullets have been used.

have followed inoculations, the people did not know they were sick. That is the danger—latent disease, particularly tuberculosis. The frequent reports of the innocuousness of the vaccine have led to its use in disease with disastrous results—such as the tuberculosis which so rapidly developed in two diabetics to whom it had been given in Brooklyn. The medical profession has not had the data to size up the situation, because some fanatics have made untrue statements, have suppressed publication of bad results and have shown intense hatred of those who discovered the facts. The subject therefore has not yet been put upon a proper scientific foundation, and many of our best men are waiting all the facts before forming conclusions. Boards of health made a great mistake in taking up the measure prematurely and have been on the defensive—a very sad spectacle in the present public health crusade which demands aggressiveness, and just at the time too we were convincing the lay public of the supreme value of sanitation. The Medical Standard must not misrepresent the situation or it will cease to be standard. It must not consider it far fetched to conclude, if two bodies of nurses under identical conditions are equally free of typhoid—one inoculated and the other not—that sanitation and hygiene have kept infection from both. The vaccinationists by taking the credit to themselves have dealt a serious blow to public health.

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**The dangers of the typhoid inoculations** are very small in the healthy—probably nil. The sick are the ones injured. The Medical Standard states that “no one advises giving them to sick men,” and therefore the danger is a “bogey man.” As a matter of fact in nearly every case of injury or death which

**A prophylactic vaccine must never do harm.** It cannot be recommended for universal use like Jennerian vaccination until it is proved safe in all latent diseases and until it is proved to confer a lasting immunity on all. The typhoid vaccine has been so conclusively proved to be efficacious for

a while in most people, that we have repeatedly urged people to run the slight risk of injury providing the risk of typhoid is greater, but not to neglect sanitation and hygiene since each person must consider himself a susceptible who derives no benefit from the vaccine. When there is no risk of typhoid it is as foolish to take the vaccine once a year, as to dose one's self every month with antitoxin, for it will do more harm than good.

**The typhoid deaths in the U. S. Army,** as published in the surgeon general's reports from 1903 to 1913 for soldiers serving in the United States, were as follows: 12, 12, 13, 12, 7, 11, 16, 9, 2, 2, 0. Thus it is seen that sanitation brought down the deaths to 7 in 1907, and after a temporary increase in 1909, the year inoculation was introduced, was repeating the process. The few who were vaccinated in 1909 and 1910 had little effect on the general result. The vaccination of the whole army was not begun until late in 1911, so that the reduction to two deaths in that year was evidently due to that excellent army sanitation of which the nation is so proud. Universal vaccination did not reduce the deaths any in 1912, and the reduction of two deaths in 1913 can be credited to vaccination or sanitation. If we must credit the vaccine, we must also blame it for the increase of deaths in 1909. The good accomplished by the vaccine is therefore very little even if we credit it with all the life saving. It does not warrant the statement of Dr. Russell of the army that "in the annals of medicine there is only one campaign that can be compared to this one and that is, the practical extermination of smallpox by vaccination." We must repeat that the typhoid vaccine

gives no immunity at all to those specially susceptible to the fever, and is evanescent in the rest, while a proper Jennerian vaccination protects everyone for life and properly performed is devoid of danger.

**The great benefit of typhoid vaccine in war** has been universally accepted in America, though many of the military doctors of Europe think the risk of typhoid and the benefit of inoculation both too small to run the risk of injury by the vaccine. A sharp epidemic may change their minds. Still, it was a big job to immunize our army of 85,000, and we have recently learned that it was found impossible in both France and England to vaccinate the soldiers in the beginning of the present war. The operation requires three or four weeks, at the end of which time the troops are on the battle field where it is impossible to bother with it. It could not be done long beforehand because the protection would fade by the time it was needed. Enthusiasts always lose their sense of proportion of other things. It is quite evident now, that the saving of a half dozen lives a year in the American Army, supposing that sanitation was not responsible, has evidently not impressed the military of Europe who think in tens of thousands destroyed by other means. Deaths by typhoid and bullets may be considered unavoidable. The war will settle the controversy and let us know whether we are right. There is still time to vaccinate the armies and it will be done if necessary and practicable. At present we are greatly chagrined at the collapse of what all had confidently asserted would end typhoid fever in campaigns. Moreover even civil law cannot accomplish the impossible, for the French law making inoculation compulsory has been

ignored. From all the facts before us we are forced to the conclusion that if we depend upon vaccine instead of sanitation for the prophylaxis of typhoid fever we will come to grief.

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**The disappearing Indians and the increase of half-breeds** are the two startling facts brought out by the thirteenth census. It is found that of the 265,683 people classed as Indians, only 56.5 percent are full-bloods, 35.2 percent are mixtures mostly with whites, and 8.4 percent unknown. We had been led to believe that the number of true Indians was increasing, but now we find not only that they are decreasing but at a rate which means ultimate extinction. Here is a medical problem of extreme interest. It has been estimated that when Columbus arrived there were only about 300,000 Indians in America as they were widely scattered and needed much land for hunting. We took away their subsistence and therefore had to feed them, yet only about 150,000 survive. Tasmanians disappeared completely as a result of the injurious factors of civilization harmless to us, and the Hawaiians have already become a negligible factor in the new population of their Island home, but we fondly believed that no such fate was in store for our Indians. We have fed them, clothed them, housed them, educated them, moralized them, vaccinated them, kept them from whiskey and protected them from every known adversity, and yet they melt away, whereas they thrived so greatly under privations and occasional famines that constant warfare was necessary to kill off the surplus. It is a question of physiology which our physiologists have strangely

neglected. We must now realize that a physique evolved for savage life, is somehow unfit to live in civilization. The type is out of place and can not be set back to an environment fit for it, and perhaps we cannot create an artificial one. Moreover, the contact with civilization is getting rapidly more intimate as they constitute but 28.9 per 10,000 of total population whereas in 1870 they were 72.1 per 10,000, and the resulting damage must be more effective. What is the nature of this damage? Can we prevent it? If not, will the world be the better or worse for their extinction? Certain types of Irish disappear from the population and no one seems to mind it, so why shed tears over a handful of Indians left behind by the progress of evolution of man and civilization? The fate of the mixed bloods will probably be the same, in spite of an apparent vigor of the present stock. Such hybrid types never have survived if the two parent types are widely different. Moreover, the men who marry Indians have somehow failed to get white wives and cannot be considered normal as a class. The offspring may inherit this parental abnormality and constitute an undesirable element of the population. Nearly 40 percent of New York's 5,209 "Indians" are part white, 62.6 percent of those in Oklahoma and 80.3 percent of the 7,000 in North Carolina. The totals are too few to make much difference to the nation, no matter what their fate, but a study of those who die might give up information of use to the survivors of all races.

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**The significance of red-hair** may seem to be a trivial academic subject of no practical importance, but there is some

evidence that these people have a much higher death rate in America than in Europe, and the study of the cause and effect of rufousness assumes considerable importance in pathology and therapy. On the theory that there are two or three pigments which, in various mixtures and amounts, cause all the numerous racial colorings, rufousness is accounted a defect due to the entire absence of all pigments except the red. It is but one degree removed from albinism in which no pigment of any kind is formed except the hemoglobin of the red blood corpuscles. It is true that albinos are defectives and though a few survive if carefully guarded from every harm, the majority meet early death and few if any are able to make their own living in an efficient way. There is something akin to this among the rufous, as few of them attain distinction and even then it is by the possession of a limited talent. It is now said that the investigations of Major Hurst, a noted eugenist, in an English village of Burbage where there are many red-headed boys and girls, show that it is always hereditary and never arises anew. He thinks that all cases are derived from a single remote case which appeared as a "spert" or "mutation" from some unknown cause. Such "mutations" may have appeared in other parts of the world but migration is competent to explain red-headedness everywhere as derived from this single individual. The condition is "recessive" and according to Mendel's law it may disappear for several generations, particularly in dark families. If one parent is red and the other dark the children are rarely red, but if both parents are red, the children are always red. In England they are not any more fiery tempered than the rest of the population, but this does not

seem to be true in America where something in the climate—probably the excessive light—irritates them, keeps nerves on edge, lessens resistance to disease and prevents efficiency. They must be given different medical management but in what way remains to be determined. They seem to be specially unfit for city life or confinement in office or factory, but there are no figures to prove this. It is another instance showing the need of more anthropologic study of our patients. When we know what diseases do carry off the red-haired, we will be in a position to tell how they are injured, how the type arose and why it has survived elsewhere but almost completely disappeared from the colonial stock.

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The pygmies of London have been noted by American anthropologists and yet there has been scarcely anything written about these remarkable little people either in scientific or popular literature. English anthropologists and physicians have noticed for a long time that the prehistoric, small, dark types which were submerged by the Seltic and Teutonic invasions, have been reasserting themselves numerically and have also been percolating back to the areas from which they were driven by these bigger, fiercer, blonder immigrants. Much of this is due to the more perfect adjustment to the climate of the oldest stocks through hundreds of millenniums of survival of the fittest whereas the last invasions have brought in types which are just enough unfit for the new climate to lose ground in proportion to the rest. The big blondes are not dying out by any means, indeed they might be increasing, and their control of

national affairs is stronger every decade perhaps, but the smaller, darker types are apparently getting more numerous in special positions which kill off the more recent Teutons. The pygmies on the other hand are apparently small sizes of all the types which make up the population, though no exact observations have been made of their physical characters. No one knows what causes such variations, but we can well imagine a thousand things which may happen to check growth, and as the unfortunates are largely in the lowest social classes we are justified in suspecting disease and underfeeding as the most common. Very small or dwarf specimens are found in every species and in every litter of pigs there is a "runt." The phenomenon seems to be universal, and there is no reason to doubt that dwarfed types have appeared in England ever since man was man. If he was too little to hold his own in those fierce days, he perished, if too big he was likely to become too aggressive and to be laid low by strategy. As a fact prehistoric skeletons of one locality and time are remarkably uniform, as also are the modern savages of one tribe. In modern civilization, on the other hand, size has absolutely no bearing upon the survival, for no matter how little or how big a man is, he can find some way of making a living and some climate which will not hurt him. Industrialism furnishes innumerable opportunities for little men who have sufficient intelligence and they do not have to resort to tailoring, shoe-making or servile attachment to the more efficient big men. Their numbers ought to increase and perhaps they are increasing throughout northern Europe which has formerly been fit for only the big types but now puts subsistence within the reach of millions of little men

some of whom cannot even shoulder a gun to keep out invaders. Defense, as in Great Britain, is in the hands of the new types, which by physical superiority have conquered their way in. If the dwarfish types are not gifted with enough intelligence for skilled labor, they are in a pitiable condition for they cannot do hard laboring work. A big imbecile can shovel dirt, but the little man cannot prosper without brains. These stupid dwarfs, clothed in rags and begging an existence are the most pitiable sights in London.

**Will America furnish pygmies** when the price of food advances to the high relative level of Europe? We have always prided ourselves on the good physique which comes with our more liberal feeding, but there is a suspicion that we have seen our best days. We are beginning the successful importation of meat from Argentine and it stands to reason that as in London there will be some men too feeble mentally and physically to get enough of it for their children. Most of our little people are foreign born, but the native born are not sizing up as formerly and some time ago the manufacturing tailors reported that the demand was for smaller sizes of boys' clothes for age than formerly. The process of dwarfing must then have been going on for some time unnoticed. It is not possible to get exact data on this subject as no records have been kept of weight and height for each year, but our "child welfare" folks are doubtless collecting such information for future use. The matter ought to be looked into now, as it is quite disconcerting to think that the pouring of hordes into the "melting pot" is to result in undersized people as in Europe, even pygmies as in London. Every immigrant may

help to shovel dirt for railroads, but he brings one more mouth to fill while the meat production is diminishing. It is all very well to say we will give these poor failures of Europe a seat at our table, but what if our own children go to school hungry?

Boys cannot grow into good citizens without plenty of food, and if we cannot increase the food, then we must decrease the immigration and the birth rate. No matter what we do, our population in the end will settle into layers as in England, where stature increases with social rank from good feeding as well as good inheritance of stock that has "made good," but let us try to keep up our bigness and physical equality as long as possible.

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**The optimum blood pressure** is now occupying the attention of the profession. Current literature would lead us to believe that physicians have ceased to worry over high pressure and are more concerned with finding out the reasons for it in each case and maintaining it at the highest point necessary for that individual. In other words, the normal senile changes which take place sooner or later, often so soon as to constitute abnormality, require a high pressure to force the blood through the constricted vessels of the affected part. As long as that pressure is maintained the functions are normal, but if the pressure is reduced some part or parts are unable to do their full duty. Every person after middle age therefore has an optimum pressure which exactly suits his circulatory apparatus and which may be very unsuitable for others. Therapy should be directed towards maintaining that state of affairs.

The old hysterical attitude of alarm over the discovery of a high reading has completely disappeared in the last year or two and is replaced by one of satisfaction that the patient is able to overcome the first downward steps to the grave. It is now known that by this remarkable provision of nature men have lived to an efficient old age with a pressure which we once considered a great danger and tried to reduce. The symptom is now looked on merely as a signal that the patient is no longer as good as he once was, and must abandon the habits appropriate to a youth of twenty. The heart is perfectly able to strengthen itself enough to pump against quite a high pressure, but it must be relieved of the extra work we formerly put on it as a part of its daily duty. The old fear of rupturing blood vessels from pressure alone is also vanishing since it has been fully realized that even an atheromatous artery is able to resist more strain than the heart is able to put upon it in ordinary circumstances. No more curious reversal of practice could be imagined than the change from a routine effort to reduce high pressure to the present desire to maintain or even increase it. We have been too prone to jump to conclusions.

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**The therapeutic uses of emetine** seem to be far greater than the first reports indicated. It will be remembered that Leonard Rogers of Calcutta discovered that it was a true amebicide and that it was a specific in the diseases due to amoebae,—dysentery, hepatic and other amebic abscesses. The cures reported sounded like miracles. Of course there have been relapses, for no specific is absolutely curative in all cases. Some pathogenic germs escape destruction

in every disease. A few malaria plasmodia will defy quinine and arsenic for years. Hence emetine must be repeated or continued after apparent cure to prevent relapses from a multiplication of the surviving parasites. All this was to be expected, but we did not expect to hear that emetine was useful in all kinds of hemorrhages although the crude drug had been used for that purpose for a half century. Rousseau advised it for post partum hemorrhage. Emetine has been successful in hemorrhage from the lungs, stomach and intestine, particularly in typhoid, paratyphoid and alcoholic hepatitis. Since it has also been useful in bronchopneumonia of the aged, we may find it valuable in all the conditions for which the crude drug was used empirically in the last century,—bronchitis in various forms, some kinds of vomiting, and in reflex spasmodic conditions. Indeed, it seems to be a very important addition to the physician's armamentarium.

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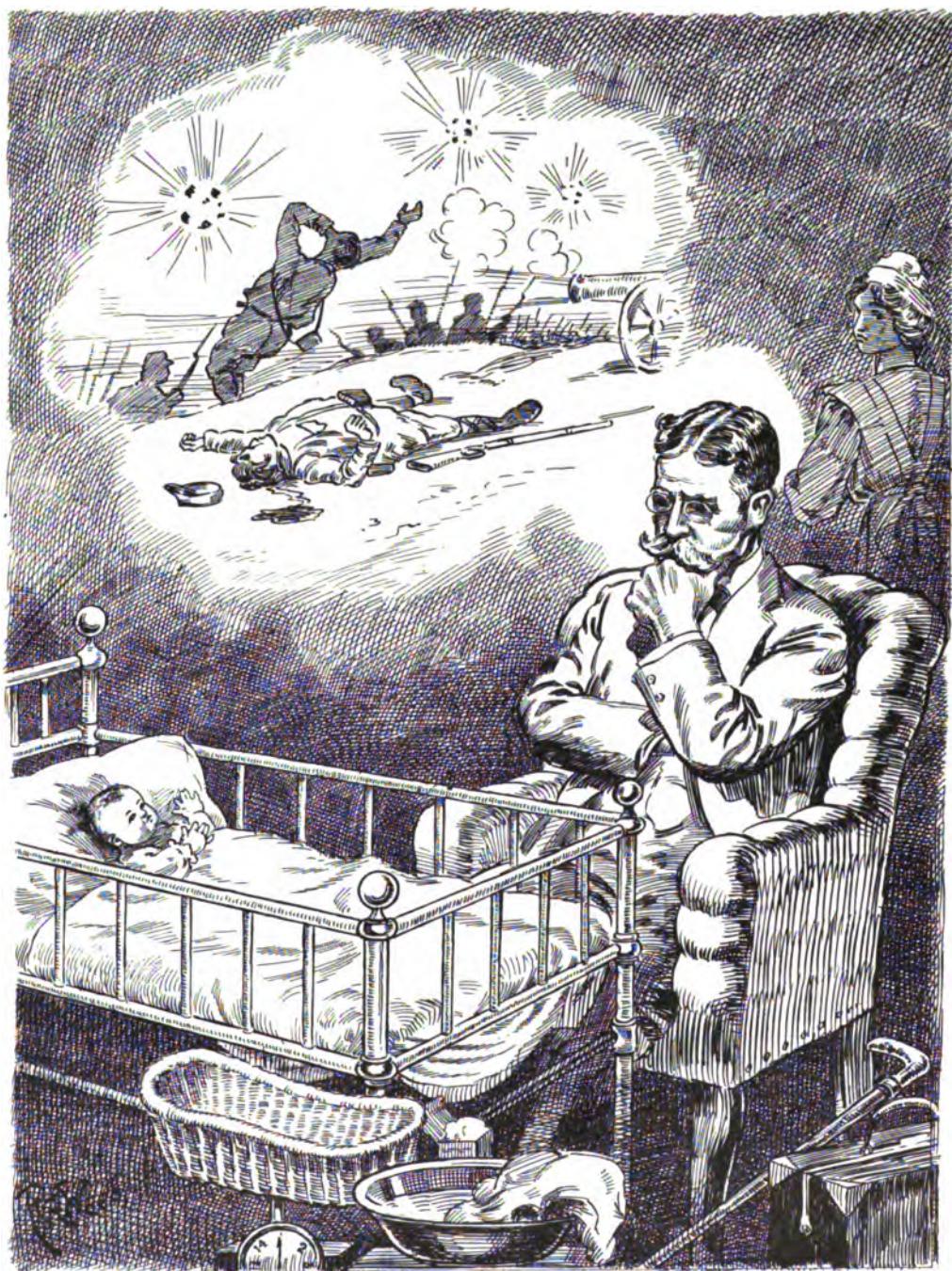
**Some more governmental medical tyranny** has just come to light in the recent decision to transfer peppermint and similar tablets from the list of drugs to that of foods. The law permits the use of a small amount of some inert material in medicinal tablets because these substances act as lubricants permitting the die to cut out a tablet more cleanly and the custom is universal and freely advertised. Suddenly, without the slightest warning, the new ruling was made, and the manufacturers could not sell the hundreds of thousands of dollars' worth of tablets in stock, which were then considered adulterated under the provisions of the pure

food law. To reimburse themselves and avoid bankruptcy the prices of other drugs must be kept unduly high. We have not heard of any defense which the officials have made, and the facts seem to indicate that the action is not defendable. There is no limit of any graft in all this, but the law thus puts into the hands of men with grafting tendencies, the means of extorting enormous blackmail and must be modified in the interests of morality. There is such great need of restrictions on the makers and vendors of impure, poisonous and adulterated foods, that the present instance of an apparent abuse of existing law, is nothing short of a disaster. There will now be still more hesitation in passing new laws which will increase the powers of men who prove themselves incapable of using what power they now have. We again suggest an inquiry into the mental qualifications of those who are guarding or jeopardizing public health. They evidently have sufficient memory to pass civil service examinations, but insufficient judgment for the jobs. Perhaps a little house cleaning is needed in the methods used by civil service commissioners in selecting the unfit for work which requires considerable discretion.

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#### **"What Will the Years Bring?"**

O little one, with all thy life before thee,  
What will the years bring, as swiftly they  
unfold?  
What edict on Time's scroll is written  
for thee,  
What fateful message does the future  
hold?



"What will the years bring?"



**Twilight Sleep.**—The use of scopolamine and morphine as an analgesic in labor has been tried for a long time by many obstetricians, but there is a remarkable difference of opinion as to the value and safety of this method of lessening the suffering. The publication of a laudatory article in a lay journal, written by a woman who had no medical training, quite naturally raised a storm of protest from the part of the medical profession accused of backwardness. Others have now taken it up and preliminary reports are rather more favorable. We would like to sermonize on the episode a little but a lay editorial writer of the *New York Evening Sun*, (September 10) has done it so well that we take great pleasure in reproducing his words. Lay journals so frequently fill their columns with quotations from the medical, that we ought to return the compliment. In this case we quote because of the splendid judicial tone which should be an inspiration to those writers who are so prone to blame doctors for not blindly taking up every new suggestion which appeals to the non medical mind as valuable. To be sure there was very unreasoning opposition to the use of chloroform when it was first suggested in labor, even to the extent of quoting from the Bible that women were under a divine course to bring forth in pain. Nevertheless, many capable physicians are still afraid of it, and prefer no anaesthetic at all if possible. They claim that the pains have such a vital use that if we make the labor painless we jeopardize both mother and child. The *Sun's* editorial is as follows:

"A medical woman, said to be the first who has made a study of 'twilight sleep' as practiced at the Freiburg Frauenklinik, comes back to this country with enthusiastic reports of what she has seen but 'cannot lay too much stress on the necessity of

administering the drug under the proper conditions.' The caution may well be borne in mind, and considering how indiscriminately the 'painless method of childbirth' has been advertised it is important for the public to be informed that there is still a difference of opinion among those most competent to judge as to whether it may safely be adopted in average cases.

A good deal of nonsense has been written about the blind prejudices of American doctors who are supposed to have cried out against a new and valuable discovery without even giving it a trial. They have been likened to the denouncers of Elliotson, Pasteur and other innovators and it is intimated that their hostility can only be attributed to jealousy, inasmuch as the 'discovery' was first published in a popular magazine. In reality the method has been used with varying success in many other places besides Freiburg and the criticisms were in the main directed against the extravagant way in which the experiments were described and the manifestly inexpert and ill-informed work of the reporters, who vied in enthusiasm with the original advertisers of Dr. Friedmann's tuberculosis remedy.

Of the evil effect of this sort of advertising we have had only too many recent illustrations, and the criticisms, if sometimes over-vehement, were hardly too strong to counteract the mischief which must inevitably follow upon the popularization of a method not yet thoroughly studied. It must by no means be forgotten that a considerable number of the most experienced gynecologists are still strongly opposed to the use of 'twilight sleep,' and that it is not a thing to be taken up lightly or without a full understanding of the risks involved."

**Professional attitude towards tobacco** is illustrated by an article on the effects of caffeine and nicotine on the activity of the intestinal musculature (Frankland, *N. Y. Med. Jour.*, Aug. 15, 1914). The author states that the larger number of his patients with digestive troubles use coffee, tea and tobacco, implying that these drugs must be the causes. This is hardly a fair argument. It would be more logical to say that one hundred percent of them eat bread and therefore bread must be the cause. Besides that, for every case of indigestion of the users of tea, coffee and tobacco, we could exhibit a thousand healthy persons who have used them with apparent benefit. The author also states that the drugs must be forbidden in the spastic stage of chronic constipation because experiments show that nicotine and caffeine inhibit peristalsis while increasing spastic contraction. The general opinion has hitherto been the opposite. The incident shows us how little we really know of the physiologic action of these drugs in the doses usually consumed. We have been under the impression that the morning cup of coffee and cigar were aids to peristalsis in a vast number of people, but must revise our opinion if these new statements are correct. It is curious nevertheless, that when any physician ever speaks publicly on the subject, he condemns. It's the fashion, and few have the hardihood to be out of style. Perhaps one in a million is damaged, but is it not the time to say a little of the good obtained by the rest of the million? One of the inconsistencies of physicians is the immense amount of tobacco consumed in their professional meetings and yet not one of them dares to defend the practice. They prefer to allow it to be inferred that they are deliberately committing slow suicide. Speak up, gentlemen!

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The problems of immunity have long engaged the attention of medical scientists. Theories galore have been brought forward, each and all designed to explain why certain diseases develop in some individuals and not in others—why bacteria act differently in different peoples' bodies, and at different times. The great importance of these questions has been recognized not

alone because of the influence their solution would essentially have on the treatment of countless diseases, but also because of the bearing accurate knowledge would have on prophylaxis generally. In the search for the true solutions of the problems of immunity a vast amount of data has been determined relative to bacterial activities and the reactions set up when pathogenic organisms gain an entrance to the body. Various observers have attempted, with more or less success, to classify the wealth of information that has accumulated along these lines, but still the different theories and explanations have been defective or lacking in greater or less degree. Not a few of the attempts to define and describe the phenomena of immunity have been so complex or confusing, or so wrapped in a mass of verbiage that they have failed to receive the attention they have deserved. Still other treatises on these important topics of susceptibility and vital resistance have been so illogical or faulty in deduction that they have been practically worthless. It is full realization not only of the great importance of the question of immunity but also of the deficiencies of the great bulk of the contributions to the subject that accounts for the genuine satisfaction with which we announce the publication of a very notable paper in our forthcoming (October) number. This article which will appear under the conjoint authorship of Drs. Henry Smith Williams and J. Wallace Beveridge is a notable piece of work. Without the slightest desire to exaggerate or to be over enthusiastic we feel that this will be one of the most important, comprehensive and far reaching contributions to the study of immunity that has ever appeared. The whole field is carefully covered, the principal theories are taken up and discussed *pro* and *con*, the various phenomena are described and shown in their proper relations, and the entire subject of immunity and its collateral details presented so plainly, yet so concisely and completely, that this article is bound to appeal to every thoughtful physician. The relations of the serums and vaccines to the forces of immunity, the manner in which these substances produce their beneficial reactions, the origin, development and action of the agglutins, how the serum reactions take place and their diagnostic significance, why various bacteria, notably the pyogenic organisms, are

subject to widely varying action and more virulent or potent for harm in some individuals than in others, and so on, are each and all carefully considered and explained with a simplicity and lucidity that are delightful. Needless to say we are much gratified not alone that our publication is to have the privilege and honor of being the medium for presenting such a scholarly and scientific article to the medical profession, but also that the opportunity is thus afforded to aid in developing a clearer and more comprehensive understanding of immunity and its relation to disease.

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**Intestinal antisepsis** has grown in importance as our knowledge concerning the intestinal tract has extended. In other words, as we have learned the role of the alimentary canal as a haven of countless bacteria which are constantly developing and throwing off poisons more or less injurious to the body, we have awakened to the urgent need of measures which would arrest the activities or completely destroy such bacteria. But the practical difficulties that have presented themselves have sadly interfered with the efficiency of these measures for arresting or annihilating intestinal bacteria, and as a consequence "intestinal antisepsis" as well as "systemic antisepsis" has been more or less of an unknown quantity. Indeed recognition of the practical difficulty of disinfecting the intestinal contents, of the large intestine particularly, was one of the main reasons for Arbuthnot Lane's recommendation to remove a portion of the canal, "short circuit the intestine" as he has termed it. All of the foregoing is well known and it is not our intention to refer further to the subject other than to call attention to the preliminary announcement which Mr. J. T. Ainslie Walker makes in this issue concerning certain studies which he has been pursuing with a view to placing intestinal antisepsis on a practicable basis. Mr. Walker who is well known to the scientific world as the co-discoverer of the Rideal-Walker test for standardizing disinfectants, is admirably fitted to investigate the chemical side of this problem of intestinal disinfection and his

article on page 594 will be read with a great deal of interest. While Mr. Walker's announcement is essentially a preliminary one and he thoroughly realizes that a large amount of both experimental and clinical work must yet be done to prove the efficacy of the method outlined in accomplishing intestinal disinfection, nevertheless the technique employed, the results already obtained in the laboratory tests, and Mr. Walker's familiarity with antisepsics warrant the hope that we are on the threshold of achievements in the direction of intestinal antisepsis, which will be as conspicuously successful as Ehrlich's splendid work in the direction of systemic antisepsis. Mr. Walker makes no reference to the therapeutic use of his technique or the clinical results that are to be obtained from its application, preferring naturally to leave this part of the investigation to those specially qualified for and engaged in this line of work. We understand that several physicians working independently have achieved results that corroborate Mr. Walker's conclusions and abundantly prove the efficiency of his technique. If his views continue to be thus substantiated it cannot be doubted that the possibilities in the treatment of many diseases will be very great. Thus in typhoid fever the value of effective intestinal antisepsis can hardly be questioned, and while the disease is a self-limited one, the disinfection of the intestinal contents is certain to exert a favorable influence on the clinical course of the disease. Again, the value of effective intestinal antisepsis in controlling the so-called typhoid carriers will be seen at once. Finally in such diseases as cholera, dysentery, enterocolitis, mucous colitis, intestinal indigestion, putrefaction and auto-intoxication accompanying intestinal stasis, hookworm, pellagra and many others in which the intestinal condition is a constant factor, the importance of effectual disinfection cannot be overestimated. With the gain in efficiency which Mr. Walker's studies and investigations so definitely promise, it would seem that the control and conquest of these and many other diseases as well, are at last at hand. Not the least of the satisfaction that will be felt if this promise is fulfilled will come from the fact that these studies and investigations were "made in America."



## THE USE OF TUBERCULIN IN SURGICAL TUBERCULOSIS.

BY

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Many difficulties arise in attempting to estimate the value of injections of tuberculin in cases of surgical tuberculosis. Not the least of these is the impossibility of stating with scientific precision that a chronic lesion of a bone, a joint, a gland, or a spine that has not undergone operation is of tubercular origin, and of tubercular origin only. The examination of tissue removed from these cases shows a steady proportion of them to be of a mild pyogenic origin, whereas beforehand they had been indistinguishable, by clinical signs, from those of tubercular nature. This is especially well seen in chronic glandular disease, in which only about 60% prove to be tubercular on examination *subsequent to removal*. The failure of tuberculin to produce a cure in the remaining 40% is then capable of explanation on grounds other than that of inutility of the tuberculin. Whilst on the other hand, the tendency of simple infected glands to undergo spontaneous recovery after the primary focus of infection has been cured may easily lead to an unduly high appraisement of the value

of tuberculin, if it happens to have been given in these cases. So far then the absence of an exact scientific test that any given lesion is tubercular and tubercular only, prevents us from testing with equal exactness the value of tuberculin. But this historical fact stands out in strong relief, wherever controversies as to the value of tuberculin arises—that mercury and quinine as specific curative agents in syphilis and malaria were established beyond all dispute upon purely clinical evidence long before any scientific knowledge of the pathology and precise diagnosis of these diseases had been gained. Such clinical evidence is entirely lacking in the case of tuberculin. Neither paucity of material nor brevity of time can be pleaded as extenuating circumstances. Tuberculin in one of its many forms and myriads of doses has been tried during the last ten years upon countless thousands of cases. From nowhere does the clear, convincing report come that such and such a preparation in such and such a dose or doses is the curative agent so much desired. It is at least of singular—if not of sinister significance—that so many different preparations of tuberculin should have been manufactured and so many different scales of dosage assigned to them. For each and all, supporters and opponents are found in plenty. These discrepancies are intelligible when the difficulties of establishing the diagnosis of tuberculosis are remembered. But

in cases proven to be tubercular by laboratory investigation of tissues removed by operation, the value of tuberculin ought to be determined. The mere fact that such tissue is readily available is in itself strong proof of the comparative uselessness of tuberculin.

Over a period of five years at the Hospital for Sick Children, Great Ormond Street, London, tuberculin was used by the writer in all cases of a surgical nature that were either suspected to be of a tubercular origin, or were of tubercular origin. These included cases of disease of bones, joints, glands, spines, testicles, kidneys, skin, nasal mucous membrane, and middle ear disease. For about one year Koch's new tuberculin was used, and for the remaining four years, Wright's bacillary emulsion. Many forms of dosage were used; many cases had citric acid given in addition for the purposes of promoting a free flow of lymph, and so ensuring the access of the tuberculin to the site of the lesion, and the ordinary routine measures of surgical treatment were carried out as well. Cases of tubercular dactylitis appeared to respond well to a course of injection of tuberculin. The early and rapid improvement leading to a complete cure was very marked in many cases. But with the exception of this group of cases no others appeared to derive benefit at all. I can recall no single instance of any other form of tubercular disease under my care, known to be tubercular, in which the course of the disease appears to have undergone modification, either beneficial or otherwise, as the result of the administration of tuberculin. In late stage cases the plea may reasonably put forward that the disease has become too far advanced to expect amelioration from this form of treatment. But with all due allowance for failure at

this stage, no evidence was forthcoming from cases in the early stages of disease that improvement was achieved by the use of tuberculin. Finally, I have abandoned its use entirely during the last two years in all forms of surgical tuberculosis and there is nothing to show in the condition of the patients that they have been deprived thereby of a beneficial form of treatment.

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## THE DANGERS OF THE OPHTHALMIC TUBERCULIN TEST.<sup>1</sup>

BY  
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The value of the ophthalmic tuberculin test has been established but there is still some question as to the risk it entails. The following cases which occurred at St. Agnes Hospital, Baltimore, are therefore not without interest.

Mr. McM. was referred to me by Dr. B. S. Chaffee, resident physician on January 17, 1913; he was suffering with very severe conjunctivitis, marked conjunctival edema and edema of the lids and sero-purulent discharge, presenting in short, a typical picture of severe gonorrhreal ophthalmia. Dr. Chaffee informed me as follows:

"Mr. McM., a student, came to the hospital about two weeks ago suffering with sore throat and mild grade of bronchitis. On examination I found some impairment at the right apex. I examined his sputum, but found no tubercle bacilli. On January 15th, I gave a 1% old-tuberculin drop into the right eye; six hours after administering it the eye was swollen

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<sup>1</sup>Read at the annual meeting of the Medical and Chirurgical Faculty of Maryland, April 29, 1914.

and greatly inflamed; temperature was  $101^{\circ}$ , this was a degree higher than at any former time. On the second day the eye was more swollen, considerable edema being present; patient was unable to see with the eye."

The pus was examined, no organisms were found and argyrol in 10% solution was prescribed. On January 21st, the swelling of the right eye had almost disappeared, the cornea was apparently clear but the eyeball was still very red. The eye felt comfortable. On January 23rd, a collyrium containing one grain of zinc sulphate and twelve grains of acid boracic to the ounce was prescribed to be used alternately with argyrol. On January 28th, the use of argyrol was discontinued, zinc collyrium alone being used. On February 4th, the external surface of the right eye was normal. The conjunctiva of the lower lid was almost free from congestion but the eyeball was considerably congested as was the conjunctiva of upper lid. The cornea was apparently clear but the sight was still hazy. On February 18th, I dilated the pupil with homatropin and found the fundus normal. With magnifying glass a number of very fine opacities were found in the cornea, in the substantia propria; the left cornea was perfectly clear. The diagnosis was superficial keratitis punctata. On March 6, 1913, I received a letter from the patient stating: "My eye does not bother me though the haze still persists. When I wake up from my nap after dinner, the white of my eye is often decidedly pink. This pinkness lasts about five minutes."

I last saw this patient on March 17, 1913. The right eye was much better. The corneal epithelium was perfectly smooth and there were only finest spots scattered over the central part of the cornea. The vision of the right eye was  $+3.0 = -1.25$  ax.  $150^{\circ} = 20/15$ .

In this case we had intense conjunctival reaction with corneal development which fortunately cleared up and the visual impairment disappeared. Later inquiry revealed the fact that the patient had had a mild acute catarrhal conjunctivitis several months previously.

Margaret M., aged 8, was seen in my service at the same hospital by my assistant, Dr. J. I. Kemler. The patient had been

under treatment at the hospital since July, 1908, for a tubercular hip. In September, 1907, she received one drop of 1% solution old tuberculin in the right eye. Marked reaction followed within twenty-four hours; the cornea became ulcerated. The condition subsided slowly leaving central corneal opacities. There were several subsequent recurrences of corneal ulcer. In February, 1913, a severe recurrence took place with marked edema of the lids and central corneal ulceration. Recovery took place slowly and vision was reduced to counting fingers at eight feet.

The other eye was not involved at any time nor was there any history of eye trouble previous to the use of the old-tuberculin.

A careful resumé of the unfavorable effects with reference to the cases published was made by Stargardt in 1909. Stargardt (*Zeitschrift f. Augenheilk.*, XXII, p. 1) refers to Citron's division into three degrees of reaction, in the most marked of which edema of the lid and punctuate hemorrhages may occur as in acute conjunctivitis. But Stargardt points out that the reaction is oftentimes more marked than in Citron's third degree, cases occurring that remind one of gonorrhreal or diphtheritic conjunctivitis lasting days or weeks. The most severe and long continued reactions followed the Höchsten-tuberculin test (Calmette). But even with the old tuberculin very severe reaction has been observed. He refers to Adam, 1% strength of solution used; Fehsenfeld, 1%; Kramer, 2%; Novelli, 1% and Schultz-Zehden, 1%. He cites some cases in which the reaction lasted for four weeks or longer: Rosenbach, 1%; Kramer, 1%; and Schultz-Zehden, 2%. Fibrinous membranes may be produced by old tuberculin. Fehsenfeld reported a case of a sixteen year old girl with severe conjunctivitis and redness and swelling of the neighboring skin and nose, of an erysipelatous character, extending to

the ear and lasting for months before all signs had passed off.

Phlyctenular conjunctivitis has been observed by a number of writers, sometimes immediately after the instillation, at other times after an interval. Stargardt collects a number of references and adds two cases of his own, in which he examined the phlyctenules microscopically.

Phlyctenular keratitis has also occurred (Krause-Hertel) and Fehr reported a case of phlyctenule at the corneal margin and interstitial keratitis. Barber after using Calmette's preparation, observed corneal inflammation in two cases and other cases are cited with iritis, pannus, corneal haziness and severe corneal ulcer. Reference is made to Goerlich's very severe case in an infant with loss of the eye. (Ulcer of cornea, perforation, phthisis bulbi).

Even with old tuberculin, damage has resulted to the vision of previously healthy eyes. Stargardt cites Eppenstein (keratitis), Krokiwicz (interstitial-keratitis) Fehzenfeld (irito-keratitis), Roemers (severe keratitis) and Schrumpf (keratitis-iritis).

The very rare occurrence of tuberculous nodules in the conjunctiva has also been noted. (Stuelp, Seligman, Damask, Collins, Bronz, Segritz, etc.).

A conjunctival inflammation may occur in an eye in which the instillation had previously been made, when a subcutaneous injection is given, even if the eye did not react to the ophthalmic test and the inflammation may be intense and injurious (Schenk). Stargardt gives an account of the varied reaction, tuberculin produces in eyes affected with non-tubercular and with tubercular affections. In some of the latter, the reaction was slight or negative; but in a large number, it was marked and the

effect was injurious.

A number of papers bearing on this subject have appeared since Stargardt's article:

Trousseau in an article on "Les dangers de l'ophthalmo-reaction" (*Clin. Opht.* 1909, p. 27), reports the occurrence of severe inflammations with resulting injury to vision. In one case there had been conjunctival tuberculosis which had been cured; in a second, tuberculous iritis; in a third, iridocyclitis of unknown etiology and in a fourth, congenital syphilitic parenchymatous keratitis. These cases emphasize the importance of avoiding the use of ophthalmic tuberculin test in eyes which have had previous disease, whether tubercular or not.

Rosenau and Anderson ("The Ocular Reaction to Tuberculin: A Warning," *Journal A. M. A.*, March 21, 1908) made the ophthalmic test in twelve healthy persons all of whom acted negatively. A second test made five or six days later gave a positive reaction in all but one and the reaction was exceedingly severe in four cases. These cases bear out the warning not to repeat the test, since "the conjunctiva of man may be rendered sensitive by the application of tuberculin, so that it reacts specifically to a second instillation."

Satterlee ("Serious result of the ocular tuberculin test," *Journal A. M. A.*, June 27, 1908) reports a case of a girl aged 18, in which the instillation of two drops of a 1% tuberculin solution produced a severe conjunctivitis followed by ulcerative keratitis and iritis and lasting many weeks. It is worthy of mention that a severe conjunctivitis had occurred four months before the instillation but the eyes were normal at the time.

Weekers (Jan. 6, 1910) reported a severe staphylococcus conjunctivitis with perfor-

ing corneal ulcer after the ophthalmic test (Calmette tuberculin 1%).

Mosso (*Oftalmoreazione e linfangioite reticolare congiuntivale recidivante. Ophthalmologica*, I, p. 380) describes two cases of recurrent lymphangitis of conjunctiva following ophthalmic reaction.

Szaboky, in a careful study of the Calmette ophthalmic reaction, (*Zeit. f. Tuberkulose*, Vol. XIII, p. 503) regards the test as not without danger; permanent damage did not occur in any of his cases but long continued and unfavorable conditions occurred frequently; before its use the patient should be informed of possible trouble. Repetition is dangerous.

Nauwelaers (*la Clinique*, Bruxelles, 1909) after having studied the reaction in a large number of children, regards ophthalmic reaction as less dangerous in children than in adults.

Achard, in an address on the conjunctival test before the Academy of Ophthalmology and Oto-laryngology, 1910 (*Trans.* p. 171), "is convinced from his own observation and from careful study of the literature, that most of the reported accidents could have been avoided. . . . He holds that the conjunctival tuberculin test, employed by unskilled hands in improperly selected cases, is a dangerous procedure; not so much on account of any inherent toxicity of the remedy, the dose employed being far too small to exert any notable toxic effect, but on account of the extreme sensitiveness and vulnerability of the organs involved. If it is improper for the general practitioner or for anyone but a skilled ophthalmologist to operate upon the eyes, it is equally improper for them to subject these organs to the possibility of injury which undoubtedly is present in a deliberately produced conjunctival inflammation; and

this is especially true when there are present any affections of the ocular apparatus whether they are tuberculous in nature or not; it is even true where there is a history of earlier though healed disease in the eye, as we shall see presently. It has been shown (first, I think, by Feer in Heidelberg and by Citron in Berlin) that scrofulous children show especially marked reactions to the conjunctival tuberculin test. According to Wolff-Eisner's reasoning this might be explained as indicative of a fair degree of tuberculous immunity enjoyed by such children; but however that may be, the fact remains that the test may expose the eyes to a very grave danger, and a considerable number of cases are on record in which even permanent injury has resulted. . . ."

"The fact remains that serious accidents have sometimes followed the administration of the conjunctival tuberculin test, can, it is true, not argue against its usefulness, but it renders the test inadvisable for the general practitioner. . . ."

On the other hand we must bear in mind that numerous observers have published reports of the extensive use of the test without any serious results. In their recent work, Hamman and Wollman ("Tuberculin in Diagnosis and Treatment," 1911, pp. 209-211) state: "As regards the conjunctival test, in several thousand instillations, we have had but two untoward results, one patient developing phlyctenular conjunctivitis which subsequently completely healed; the other an episcleritis, which also healed and which we are not sure was due to the test. . . . One is, however, obliged to consider with respect the many reports of severe recurring conjunctival inflammations, of phlyctenular conjunctivitis and of corneal ulcers with permanent

opacities. Some observers have had such accidents frequently, while others, and notably those who have used the test most, say they have seen no ill effects. It is important that many ophthalmologists take a stand against the test. Why results should be so divergent, it is difficult to explain. Most of the unfavorable results have followed instillations in already diseased eyes or of too strong solutions, but this is not true of all the cases. There are certain precautions that must be followed in making the test, and when these are observed, accidents will be fewer. For at least the first instillation only a weak solution should be used, not over 1% old tuberculin, and we should think less than 0.5% of the precipitated tuberculin, although we have had very limited experience with the latter. The eyes should always be carefully inspected before the instillation is made, and the least abnormality regarded as a contraindication. A second instillation should never be made in the same eye, at least for several years. Considering the tendency of old people to conjunctival inflammation, and particularly to corneal ulceration, it were probably better to exclude these from the test. We think that our experience justifies us in continuing to use the conjunctival test after the method we have outlined and with the precautions indicated. This we have done since these data were compiled and have never had another untoward result."

"A second objection is that a conjunctival injection whether there be a reaction or not, often renders subsequent administration of tuberculin subcutaneously for diagnosis or treatment, if not dangerous, at least unpleasant. At times a recurring reaction comes after the dose given is not large enough to liberate a general reaction. This secondary reaction not only may be

more severe than the first, but may be severe even though absent after the instillation. It is said that under the tuberculin treatment constant recurrences may make injections very discomforting. Such manifestations during treatment, however, must be very uncommon. In a large number of cases we have observed it only twice. It is the diagnostic injections that are particularly influenced. If we feel that it is advisable to give subcutaneous injections to obtain a focal reaction, we believe a previous conjunctival instillation need not deter us. In our cases all such recurring reactions have promptly and satisfactorily subsided. It would be better, of course, to omit the conjunctival test in patients to whom we wish to give tuberculin subcutaneously."

In view of the many cases of excessive reaction and of serious injury, it is not surprising that there are those who warn emphatically against the use of the ophthalmic test (*Wiens and Guenther, Münch. Med. Woch.*, 1908, p. 1871) or to learn that in Prof. Müller's Medical Clinic in München, the use of the test has been forbidden. (*Münch Med. Woch.*, 1908, p. 1066).

I am convinced that this course is wise and should be followed generally.

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Never neglect to warn a patient who is using chrysarobin ointment of the danger attendant upon getting some of it in the eyes. A severe conjunctivitis, if nothing worse, has resulted from the omission of this precaution.

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The cystoscope and a rectal examination offer the most exact means of determining the size of the prostate. One cannot but believe that measuring devices are the inventions of men possessing but slight acquaintance with the cystoscope.—*Am. Jour. of Dermatology.* *Digitized by Google*

## THE ACQUISITION OF TUBERCULOSIS.<sup>1</sup>

BY

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New York City.

Experimental investigation has stamped tuberculosis as contagious, that is, accepting the bacillus of Koch as the essential element of the disease.

Tuberculosis is not contagious in the same sense as scarlet fever, smallpox, measles, etc., but it is contagious in the fact that the bacilli can be directly inoculated into the system, and under favorable circumstances will produce this very common and most dreaded disease. This being true, the next question is: Where and how does the infection take place? Science replies: By direct inoculation after birth.

In the past, tuberculosis was considered largely as an inherited disease. In the present scientific acceptance of the term, tuberculosis is not an inherited disease, but is a condition that has always to be acquired after birth. This is established upon the following data—namely an abundance of carefully recorded post-mortem evidence, which gives the exact frequency of tubercular lesions from the time of conception up to the fifteenth year of extra-uterine life. Included in this evidence is the Inaugural Dissertation of Bolitz<sup>2</sup> in 1890, where the results of 2576 necropsy examinations in children are recorded. In the still-born none were found tuberculous. Under the fourth week of extra-uterine life, tuberculous lesions were not found. From the fifth to the tenth week, less than one

per cent. gave evidence of tuberculosis.

But from the third to the sixth month, a fraction over eight per cent. contained well-defined tuberculous lesions. From the sixth to the twelfth month, a fraction over eighteen per cent. were found to be tuberculous. From the first to the second year, a fraction over twenty-six per cent.; and from the end of the second year to the fifteenth, at least thirty per cent. were the seat of tuberculous lesions.

It has been further established that primary infection rarely occurs after this age; that whenever tuberculosis manifests itself later in life, it is due to a childhood infection which has been lying dormant in the system—to be nursed into activity solely by a lowering of the general nutritive processes of the body, and, finally, a localization of this deteriorated nutritive activity at some specific spot, as the lungs, other viscera, or in the bones, until a soil is developed suitable to the growth of the bacilli.

Here again, the emphasis rests not upon the inoculation but upon the lowering of the nutritional forces.

This being the case, all the clamor about the danger to a locality from the presence of a preventorium or sanatorium for tuberculosis, is based upon a false idea of tuberculosis and its acquisition.

In the face of such knowledge as this, and abundance of proof, the question is still asked: By what authority is it known that tuberculosis is not an hereditary disease but is one that must always be acquired after birth by being inoculated with the bacillus of tuberculosis?

To the true scientist, this question appears absurd. But the fact that the question is propounded proves conclusively that there is still doubt in the minds of some as to the true nature of tuberculosis. There-

<sup>1</sup> Read before the American Therapeutic Society, May 29, 1914.

<sup>2</sup> Bolitz: Inaugural Dissertation, Kiel, 1890.

fore, at this time, when science is exerting her best efforts to elucidate every phase of disease, and when the health authorities are making honest efforts to prevent the spread of disease, the medical profession should have a clear conception of what disease is, how it is acquired, and how its spread can most effectively be prevented.

While tuberculosis is found, as it is, in almost every family from the Atlantic to the Pacific, and from pole to pole, it naturally disturbs the whole United States and, in fact, the whole earth's population, when the scientific world stamps tuberculosis as a non-inheritable disease and proves conclusively that it is truly contagious. Added to this, comes the suggestion to institute vigorous methods for its extermination from the human race, which still further excites the indignation of the community at large.

All this, however, does not alter the facts as to the methods by which tuberculosis is developed, nor as to the means and methods by which it is possible to exclude tuberculosis from those not yet infected. While it may be hard for the lay mind—in fact, for some in the ranks of the medical profession—to give up the old theory that tuberculosis is inherited as a disease *per se*, nevertheless, it is the duty of the medical profession, acting as the true guardians of the public health and welfare, to bow gracefully to scientific advance and to accept the undeniable facts as they are announced by those who have the skill and opportunity to establish the fundamental truths in relation to the etiological factors of disease.

That tuberculosis is not an inheritable disease, is established by defining what tuberculosis really is and by demonstrating the conditions or factors necessary for the production of the specific pathological

lesions which are now recognized by all leading pathologists as tuberculous in their nature.

For the development of tuberculosis, three conditions are essential:

*First:* An alteration in the chemico-physiological transmutation processes of the animal economy, so that the true nutritional changes are brought to a point considerably below the normal standard.

*Second:* Some local injury by which an inflammatory action is excited and those deteriorated nutritional processes are still more reduced, until a protein pabulum is produced at some point in the system which is favorable to and will support the growth and development of this particular definite vegetable micro-organism, named by Professor Koch bacillus tuberculosis.

The first condition, and nothing more can be inherited.

The favorable soil for the growth of the bacillus of tuberculosis can be acquired, quite as well as inherited, but for the actual production of tuberculosis a *third* factor is absolutely necessary, to wit: the inoculation of this new and favorable soil with some living tubercle bacilli from a previously infected individual, or source.

Its most frequent source is the human species. But the experiments carried out by the British Tuberculosis Commission definitely prove that the bacilli found in certain human cases are capable of producing in cattle a disease clinically indistinguishable from tuberculosis of the bovine type. Furthermore, typical bovine bacilli were discovered in several cases of tuberculosis in men. While Koch and others have claimed that the human species is not susceptible to the bovine type of bacillus, the consensus of opinion at the present time is that tuberculosis can be produced in the

human species through inoculation with bacilli of bovine origin.

Its acquisition from the bovine source, however, is very much less frequent than our health authorities are inclined to proclaim. In fact, it is rarely acquired from this source.

At this point, the question arises as to how the bacilli gain access to this favorable soil. This is best answered by the following extract, taken from Professor Brooks' recent work on pathology<sup>1</sup>: "The distribution of tubercle bacilli and their entrance into the human body take place, on the one hand, by inhalation (aerogenous infection)—sputum containing bacilli becoming dried and then bacilli entering the respiratory passages along with rising dust—and, on the other hand, through the agency of oral secretions containing bacilli, ejected by tuberculous subjects during speaking, coughing, etc."

According to Aufrecht, the route of invasion in pulmonary tuberculosis is by the way of the tonsils, cervic, and lymphatic glands. "Furthermore, infection may occur through the gastro-intestinal canal—including the oral cavity (tonsils, diseased teeth)—by ingestion of material containing tubercle bacilli (milk, etc.); also through the uro-genital canal during coitus; and, finally, through the visible mucous membrane (conjunctiva) and the skin in localities which have been injured or perhaps deprived only of epithelium in contact with parts upon which tubercle bacilli are present."

"Inoculation tuberculosis is not rare. Here belong tuberculoses of the skin of the

hands of individuals who handle tuberculous material, and cases of tuberculous infection of wounds, e. g., of the prepuce after ritual circumcision, and tuberculous infection of the female genitals through coitus."

When tubercle bacilli have entered the human body in this manner and have given rise to infection, the process is at first entirely local. Further extension is due to increase or the dissemination (metastasis) of the bacilli in the body.

These facts alone do not prove that tuberculosis is not inherited, because it would appear to be within the range of possibility for the living bacilli of tuberculosis contained in the tubercular tissue of the mother to pass through the placenta to the fetus in the uterus. If this were proved to be the method pursued universally, or even in a moderate number of instances, then tuberculosis could be inherited, but even then it would be by direct inoculation from the mother to the offspring *in utero*. Repeated and extensive observation and research in thousands of cases, however, have failed to discover a single well-authenticated instance in the human subject in which the bacilli of tuberculosis were to be found in the fetus *in utero*, or in its tissues within the first week after birth.

That the bacilli of tuberculosis rarely, if ever, pass from the mother through the placental tissue to the fetus *in utero*, is explained by the fact that the growth and development of the embryo and fetus is one of the most complicated and perfect processes in nature. Every step in the developmental act is guarded most perfectly, and each step is kept at the highest point of nutritive activity. This is often accomplished, however, at the expense of the mother's inherent nutritive vitality. Thus

<sup>1</sup> Brooks, H. T.: Text-Book of General and Special Pathology, F. A. Davis Co., Philadelphia, 1912, p. 488.

<sup>2</sup> Berliner Klin. Woch., 1910, No. 40, p. 1829; quoted in Brooks' Pathology.

the placental tissue is maintained in a nutritive condition which is incompatible with the growth or passage of the bacillus of tuberculosis from the maternal to the fetal tissue, and the fetus is protected absolutely against infection from the mother. It is also true that actively tuberculous subjects are little likely to become pregnant, and if the tuberculous process is limited and circumscribed there is comparatively little danger of the bacilli reaching the placental structures, consequently there is practically no chance of the mother infecting the fetus *in utero*.

In this manner it is established, so far as bacteriological research has advanced our knowledge, that tuberculosis is not and cannot be transferred from the mother to the offspring *in utero*, and consequently tuberculosis is never inherited. In fact, a faulty nutritive activity is much less frequently inherited than is commonly supposed, but the perfect product as it comes from the uterine cavity degenerates rapidly when it leaves the guiding hand of Dame Nature and is entrusted to the care of the too often ignorant and misguided parent and nurse.

What a convincing argument for the truly scientific physician to try in all his work to imitate as closely as possible the laws of nature rather than those artificially established by man? As the weeks and years advance, the nutritive vitality of the human organism progressively deteriorates, local inflammations are excited, the proper soil is developed, and finally the non-tuberculous system is successfully inoculated with the bacilli of tuberculosis, and the lesions which are characteristic of true tuberculosis are developed. These anatomical changes have never been found in the human organism until after the fourth week of extra-uterine

life has been passed. The frequency with which they are found increases yearly from five-tenths of one per cent. up to the fifteenth year, when the maximum of thirty per cent. is reached. Therefore, the assertion is justifiable that tuberculosis, as such, is never inherited, but is always acquired after birth. The most that can be inherited is a definite chemico-physiological activity, and this occurs much less frequently than is commonly supposed.

The chemico-physiological deterioration is more often developed during the first few weeks of extra-uterine life. The local injury, the inflammatory processes, the development of the favorable soil, and the final inoculation with the tubercle bacilli, all come later, or after the fourth week of extra-uterine life, the greatest danger of inoculation being reached at the fifteenth year.

Dr. Southworth, in his recent inaugural address before the Medical Association of the Greater City of New York, on February 16, 1914, called attention to the great strides that have been made in safe-guarding the child from deterioration and infection between the first month and the fifth year. He further pointed to the fact that from the fifth to the fifteenth year, the child is sadly neglected. He indicated that the liability to a lowering of the nutritive processes and any infection with tubercle bacilli is, if anything, greater than in the past. Once this decade of life is fully safeguarded against a deterioration in its nutritive activity, as is now the first five years, a very decided reduction in the number of tuberculous cases will be fully apparent, and not until this has been accomplished can it be expected.

In some instances, a whole family of children may be inoculated and die, one

after another, at various ages, and still later one or the other of the parents may succumb to a fatal tuberculous inoculation. Such instances in no wise prove that the children inherited the disease from their parents, but the foregoing facts elucidate perfectly all those obscure clinical phenomena here instanced.

Thus, it is proved conclusively that there is a well-founded theory regarding tuberculosis and one which does not defy natural laws. It is found also to fit all conditions, to explain perfectly all cases, and therefore it should be vigorously enforced at all points, if perfect protection against the spread of tuberculosis is to be secured.

While it is impossible to exterminate tuberculosis as perfectly as theory would indicate might be possible, it is still within the range of high probability to prevent the development of hundreds of thousands of cases of tuberculosis every year. Its accomplishment, however, is to be effected along the line of the prevention of a soil suitable to the growth of the tubercle bacilli rather than to over-strenuous efforts to prevent inoculation. The health boards are moving in the right direction, and they should receive the individual support of the members of the profession in every practical attempt which they make to enforce scientific methods for the prevention and spread of diseases of all kinds. The profession should no longer try to shirk responsibility and delude itself with the old idea that tuberculosis is inherited and not acquired, and for that reason little amenable to prevention and treatment. To call tuberculosis communicable instead of contagious is simply begging a scientific question. The sooner the profession and the laity recognize the inevitable fact that tuberculosis is a directly contagious disease and should be

dealt with as such, the sooner will it be possible to educate the community up to that high scientific standard that must be acquired before the most perfect prevention of tuberculosis can be made thoroughly practicable. This once attained, the terrible destruction of life by this wide-spread malady can be successfully arrested.

When people as a whole have grasped the true problem and understand fully the cause of tuberculosis in the right light, and especially the methods by which tuberculosis is developed, it will be a comparatively easy task to teach them how to prevent the deterioration of the system which makes possible the successful inoculation of tuberculosis from one individual to another. Too much stress has been laid upon the infection, and too little attention has been directed to preventing the production of a soil that will sustain the life of the bacilli after inoculation. This learned, as it should be done, every one will quickly appreciate the danger from inoculation and will willingly follow all practical directions for the prevention of tuberculosis.

All this accomplished, a decided decrease in the number of deaths from tuberculosis should follow year after year, while now the actual number of deaths credited to tuberculosis is increasing.

46 West 83rd Street.

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Whenever there is danger of metastasis from mumps, either to the mammary glands or to the testicles, apply a hot mustard poultice over the parotid gland and put the patient to bed for a few hours. The inflammation will be attracted to its original site and there remain, and will abate with proper treatment.—*Dr. Ellingwood.*

## VOLATILE SUBSTANCES ISOLATED FROM TUBERCLE BACILLI CUL- TURES AND THEIR EFFECTS ON EXPERIMENTAL TUBERCULOSIS.<sup>1</sup>

BY

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A few years ago we happened to observe a peculiar tuberculin reaction in a patient from the Tuberculosis League Hospital in Pittsburgh. This patient, who helped as orderly in the laboratory complained of headache and general malaise every time when old tubercle bacilli cultures were destroyed. About the same time two friends, whilst sterilizing old tuberculin bottles happened to work in a closed room. After a short stay in the steamy, pungent atmosphere, both friends were obliged to go to bed, suffering for several days from intense fever, chills, headache, general malaise (constitutional tuberculin reaction). The symptoms passed off within a few days without any further consequences. These particular observations suggested the following experiments, with the aim to detect any volatile substance escaping from tubercle bacilli cultures, and the following method was resorted to.

A thousand cc. of four week old human tubercle bacilli cultures (glycerine broth) were poured into a long necked distilling

flask (capacity 3 liters). Into this mixture an angulated glass tube was introduced which reached to the bottom of the flask. Through this connection a constant steam current was passed into the culture fluid. Another bent glass tube with a bulb (to prevent the passing over of solid substance from the flask) made the connection with the condenser. A small gas flame under the big flask maintained a temperature of about 37-40°. The product of the distillation was condensed and the distillation continued until the pungent odor of the medium had disappeared. The distillate itself, a slightly opaque fluid, showed a whitish precipitation after standing. The entire distilled fluid was treated with ether in a funnel separator, the extract filtered through a dry filter paper and the filtrate evaporated on a water bath. As residue a thick, brownish yellow oily substance of a pungent odor was obtained. This substance, regardless of frequent solution in ether and subsequent evaporation did not crystallize. With ether, ethyl and methyl alcohol, a yellowish fluid was obtained. The substance could not be taken up in water nor in a physiological salt solution, which property would indicate a lipoid character. A faint reaction with potassium ferrocyanide and acetic acid was produced with the original distillate, no precipitation with either concentrate nitric or diluted acetic acid, nor a biuret reaction could be obtained (protein substance).

The volatile substance, stained with carbol fuchsin, proved to be acid fast and resembled the fatty substance extract from tubercle bacilli treated with benzyl chloride. For the biological test, the oily substance was dissolved in methyl alcohol and injected into a series of tubercular guinea pigs as follows:

<sup>1</sup> Read at the Fifteenth Annual Meeting of the American Therapeutic Society, held in Albany, N. Y., May 29 and 30, 1914.

*Guinea Pig No. I.* Jan. 16, 1911, weight 590 gm.; injected intraperitoneally with 0.05 gm. human tubercle bacilli. It lost in weight only during the first week after injection. On Feb. 5th, it was injected with methyl alcoholic residue from the distillate.

It became stupid and did not eat for 24 hours. After this time it gradually increased in weight until it weighed 650 gm. on March 17th, after which it declined and died April 9th, thus living 83 days after infection, total loss in weight 120 gm.

*Autopsy.*—Hemorrhagic fluid in peritoneal cavity; peritoneum thickened and injected; mesentery glands enlarged, caseous degeneration; a few tubercles the size of a pin head in the mesenterium. Liver enlarged; several miliary tubercles on its surface. Spleen enlarged; several miliary tubercles on the lower pole. Pleural cavities filled with hemorrhagic fluid. Lungs hyperemic; on section many miliary and submiliary tubercles, especially in lower lobes. Diaphragm studded with numerous tubercles; a few tubercles in the ligamentum latum.

*Guinea Pig No. II.* Jan. 16, 1911, weight 765 gm.; injected with 0.05 gm. human tubercle bacilli. The animal lost 45 gm. during the first two weeks.

Feb. 6th it received the same treatment as guinea pig No. I. After one day of illness it gained 70 gm. during the next two weeks, then fluctuated until May 12th (weight 735 gm.), after which it gradually lost. June 9th it was reinfected with 0.01 gm. human tubercle bacilli, after which the loss of weight was more rapid and the animal died spontaneously on July 13th, weight 440 gm.

The animal lived 143 days after first infection, total loss in weight 325 gm.

*Autopsy.*—A small ulceration at site of injection; several tubercular nodules on underlying peritoneum; four tubercles on the posterior aspect of peritoneum. Inguinal and mesentery glands enlarged. Liver enlarged; several grayish nodules in the right and left lobe. Spleen enlarged. Kidneys pale. One small tubercle on the diaphragm. Several tubercles on the median and posterior surfaces of both lungs. Bronchial glands enlarged. Pleura and heart without change.

*Guinea Pig No. III.* Jan. 16, 1911,

weight 530 gm.; injected intraperitoneally with 0.05 gm. human tubercle bacilli. It lost 90 gm. in weight when on Feb. 10th, it was injected with the methyl alcoholic solution.

It increased and weighed 515 gm. on May 26th, then lost 45 gm. between that time and June 19th when it was reinfected with 0.01 gm. human tubercle bacilli. The animal continued to gain in weight until it died July 14th, 190 days after the first infection. The total gain in weight was 35 gm.

*Autopsy.*—Some cloudy fluid in the abdominal cavity. Parietal peritoneum covered with tubercles, intestines and omentum without change. Spleen hyperemic. Liver enlarged; one small yellowish nodule on the lower surface of the right lobe. Several small gray nodules in the region of the xiphoid process. Several caseous tubercles on the median and posterior aspect of the lower lobe of the lungs; less involvement in the upper lobes, the middle lobes slightly involved. Diaphragm, heart and pleura without change.

*Guinea Pig No. IV.* Jan. 16, 1911, weight 585 gm.; infected with 0.05 gm. human tubercle bacilli. Feb. 16th it had lost 125 gm. when it was injected with the above described solution. The four days following the animal was very sick, lost in weight, but recovered and reached its maximum weight by May 26th. Then it began to lose, and by June 19th had lost 68 gm. It was reinfected with 0.01 gm. of human tubercle bacilli. It then gained 90 gm. but owing to unfortunate circumstances the animal was not observed longer.

*Control Guinea Pig.* Jan. 16, 1911, weight 320 gm.; injected intraperitoneally with 0.05 gm. human tubercle bacilli. At the time of its spontaneous death, 50 days after infection, it had lost 40 gm.

*Autopsy.*—Peritoneum, especially the paries posterior, covered with many tubercles the size of a millet seed. Mesentery glands enlarged. Several miliary tubercles on the liver. Spleen greatly enlarged; several miliary tubercles on the spleen. Lungs infiltrated with many tubercles. Bronchial glands enlarged. Pleura and pericardium without change. Several tubercles on tubes and broad ligaments.

*Control Guinea Pig for reinfected animals Nos. II, III, IV of Series I.*

Guinea pig infected on June 12th with 0.01 human tubercle bacilli. Initial weight 550 gm. At death 520 gm., lived thirty days after infection.

*Autopsy.*—A cheesy mass the size of a hazelnut in the abdominal wall. Inguinal glands enlarged and caseous. Peritoneum covered with many tubercles. Mesentery glands enlarged. Five caseous tubercles on liver. Several tubercles on spleen. Kidneys and intestines without tubercular involvement. Numerous tubercles, partially conglomeration on both upper lobes of lungs; numerous tubercles in the middle lobe and the median and posterior part of lower lobes. Bronchial glands enlarged. Pleura without change.

*Guinea Pig No. I, Series II.* March 21, 1911, weight 645 gm.; injected with 0.01 gm. tubercle bacilli. April 25th it had gained 60 gm. when it was injected with 1 cc. of the methyl alcoholic residue. It lost 70 gm. during the next three days, and between this time and June 12th, it gained 45 gm. It was then reinfected with 0.01 gm. human tubercle bacilli, gained in weight (its weight being 860 gm.). After another injection of methyl alcoholic solution on Oct. 9th it lost 10 gm., and was reinfected on November 20th with .01 gm. human tubercle bacilli. The animal was still alive on Jan. 31st, having lost 30 gm.

*Guinea Pig No. II.* March 21, 1911, weight 580 gm.; injected with 0.01 gm. tubercle bacilli. Its weight remained stationary until treated with same amount of the methyl alcoholic solution as guinea pig No. I, when it gained 55 gm. On June 12th it was reinfected with 0.01 gm. human tubercle bacilli and continued to gain in weight until Nov. 20th (its weight being 800 gm.). It was reinfected with 0.01 gm. human tubercle bacilli, and was still alive (Jan. 31, 1912) having lost 80 gm.

*Control guinea pig for first infection, Series II.*

March 21, 1911, weight 520 gm.; injected intraperitoneally with 0.01 gm. human tubercle bacilli. At death, 40 days after infection, it had lost 125 gm.

*Autopsy.*—A few tubercular nodules in the peritoneum and mesenterium, miliary tubercles with cirrhotic induration of the liver. Spleen enlarged; on section, many tubercles. Many tubercles in both lungs.

Kidneys, heart and genitals without change.

Tubercular guinea pigs injected with the methyl alcoholic solution showed a constitutional reaction, but none of the animals died. There is no doubt that we deal here with a mild specific reaction. The control animals which were infected at the same time and injected with 0.5 cc. of old tuberculin died within 24 hours.

It seems that the tubercular animals treated with volatile lipoid substance showed an increase resistance and outlived the control animal for different lengths of time:

Guinea Pig No. I 33 days, being treated 21 days after infection.

Guinea Pig No. II 148 days, being treated 25 days after infection.

Guinea Pig No. III 190 days, being treated 25 days after infection.

Guinea Pig No. IV 144 days, being treated 25 days after infection.

No. I showed greater pathological changes than the control.

In regard to reinfection, it seems a single treatment does not in all instances give permanent immunity to tubercular infection. No. II lived one day longer than the control. During the reinfection the loss in weight was 90 gm. in comparison with 125 gm. of the control animal. After reinfection it gained 110 gm., while the control lost 125 gm.

Guinea pig IV lived longer than the control and gained 80 gm. The pathological lesions also show less involvement in No. II than the control. A more favorable result is noted in No. III which outlived the control for a longer time.

The most favorable result was obtained with guinea pigs of series II, Nos. 1 and II. The animals treated with a second injection of the distillate outlived the second reinfection, whilst the control animal died, af-

fected with miliary tuberculosis. Further experiments along this line will be made.

From these few experiments it may be concluded, that in the tubercle bacilli there is contained a volatile substance chemically of a lipoid nature, which possesses a much stronger penetrating odor than the original tubercle bacilli culture. The chemical nature of the substance and the presence of a volatile protein split product (suggested by the ferrocyanide test) must be ascertained by further, more extensive investigations.

In literature we find a few reports of acute intoxication which resulted from the emulsification or evaporation of tubercle bacilli culture—Oehlecker (*Untersuchungen über chirurgische Tuberkulosen, tuberkulose Arbeiten aus dem Kaiserl. Gesundheitsamte*, 1907, Heft 6, S. 110), emulsified moist tubercle bacilli culture and was seized with a slight chill, rise of temperature to 102° and general malaise. These symptoms wore off after 24 hours. According to his observation certain strains produce these symptoms more easily than others. This statement with regard to intoxication (dull headache, drowsiness) was confirmed by Much. Further proof of such a possibility was added by Leschke (*Vergiftung mit den Riechstoffen der Tuberkelbazillen. Medizinische Klinik*, 1911) who worked in Much's laboratory. His experiences can be briefly mentioned as follows. After several hours of work with tubercle bacilli culture he experienced drowsiness, general lassitude and was obliged to go to bed. In the course of several hours, intermittent chills, temperature of 102°, headache, general malaise, restlessness, psychic disturbances, confusion of ideas, excitability without hallucination, in brief, symptoms of acute amen-

tia were present. These manifestations continued for 12 hours with the exception of headache, which persisted for several days.

According to our interpretation we believe that underlying these manifestations is not a simple intoxication, but probably combined with it there must be a hypersensitivity, because the symptoms seem to be more pronounced in individuals giving a marked tuberculin reaction. So far no definite explanation for the cause of these morbid manifestations has been offered or attempted. Rosenau (*Journal of Medical Research*) claims that anaphylactic symptoms follow the injection of condensed expired air, from a human being, into a guinea pig, which previously was sensitized with human serum. His opinion is that certain split products of the protein molecule are volatile. If such is true, the growth of microorganisms on artificial mediums would produce volatile split substances from the protein molecule during metabolism. For such a proof extensive experiments would be required.

Vasilescu (*Centralblatt für Bacteriologie und Parasitenkunde Originale*, 1909-1910, Vol. 53) was the first who distilled tubercle bacilli culture, and first detected in the clear, colorless distillate an odor similar to that of tubercle bacilli; 5 cc. of the distillate injected into rabbits and guinea pigs, caused a fall of temperature of .5° C. This reaction lasted only 5-6 hours. A decrease in weight of 50-80 gm. within 24 hours after the injection was noticed. This loss was overcome after 10 days. A number of rabbits were reinjected, they showed the same loss in weight, and after a third injection about 20 per cent. of the animals died. In healthy guinea pigs by the same injection of 10 cc. as well as 5 cc. of the distillate, the same result could be observed.

If we have reason to admit the possible formation of volatile split products in growing tubercle bacilli, the exact chemical and biological qualities of these bodies require more experimental work. The question also remains undecided, whether this or these substances are akin to tubercular toxin, and whether they are identical with those bodies which produce the hypersensitivity.

In reporting our results we know that experiments on a larger scale are necessary, and although the question has not yet passed its experimental stage, it might in the future give the basis of a treatment by inhalation of a definite amount of these chemical substances to tubercular patients, in cases where a mild reaction is the aim of the treatment and where hyperdermic tuberculin administration can not be given.

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#### LITERATURE.

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A solution of formaldehyde kept in readiness will be found efficient as a local anti-septic for many lacerations or abrasions, and especially for the bites of insects.

Dr. Samuel Floersheim considers ipecac useful in stimulating hepatic action. For this purpose he gives the powdered extract in capsule or pill form, never using the wine or tincture. He has never employed the drug as a hemostatic.—*Med. Standard*.

## THE TUBERCULOSIS HOME HOSPITAL EXPERIMENT.<sup>1</sup>

BY

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This brief communication refers to recent work carried on by the New York Association for Improving the Condition of the Poor in connection with a specially constructed block of tenement-houses placed at its disposal by a number of wealthy philanthropic individuals.

The report of the Association presenting a statement of the methods, results and comparative cost during the first year (1912-13) in the combined home and hospital treatment of families made dependent by tuberculosis, seems to be deserving of special attention, as the record of a new and interesting departure. In the home hospital, the "East River Homes," under the general direction of Dr. Linsly R. Williams, now deputy State Health Commissioner, 27 families, 79 members of which were tuberculous, lived in sanitary homes, had ample sunshine and fresh air, good and abundant nourishment, freedom from undue work and worry, reasonable segregation, skillful medical care, and constant nursing supervision. During the year 11 of these families, containing 23 tuberculous patients, 12 of whom were wage-earners, were discharged. Of the 11 families, 6 were rehabilitated physically, socially and economically. The other 5 had to be dismissed for persistent intemperance or refusal to take advice. The condition of these, however, was improved in consequence of the treatment received.

<sup>1</sup> Read at the Fifteenth Annual Meeting of the American Therapeutic Society, held in Albany, N. Y., May 29 and 30, 1914.

Of the 135 persons in the hospital 54 were consumptive, and 25 suspicious cases. The results obtained with the adult patients compared very favorably with those of the best sanitoriums, and it is worthy of note that no new case of tuberculosis developed after admission. 61% of the adult patients were apparently cured, in 22% the disease arrested, and 11% were much improved. In only four cases was there no favorable progress. Three of these patients it was found necessary to dismiss for refusing to follow advice, and the fourth, who was in an advanced stage of the disease when admitted, died. In the 65 children and 16 infants treated the improvement was also most satisfactory. Of these, 18 were tuberculous, 23 were suspicious cases, and most of the others were excellent candidates for the disease. Upon admission practically all were under-developed, but at the end of six months each child had reached a weight normal for its age.

It is the belief of the Association that the remedying of social ills is just as urgent as the cure of tuberculosis, because without rehabilitation the family will continue to live under abnormal conditions resulting in recurrences and fresh developments of the disease. In every instance the families received at the Homes had been forced into poverty, and some were wholly destitute.

At the time of admission the average income among the families which were discharged as rehabilitated was \$6.42 a week. One of the families was absolutely destitute, and the income of two others ceased when they moved to the Homes. When they were discharged, however, the average income of the six families amounted to \$15 a week. The conditions in one of these

families "before" and "after" are thus described in the report:

Mrs. K., whose husband is in a State hospital for the insane, and her five children, from 10 to 18 years of age, before admission to the Home Hospital lived in a two room apartment. Their home, though bright, sunny and immaculately clean, was so congested that the mother and boys were compelled to sleep in one bed-room, while the oldest child, a daughter, had slept for years on a board and two chairs. They had very little furniture; not even a table. The woman attended a tuberculosis day camp, and the family income was but \$4.50; to which a relief society was adding \$6 weekly. During their residence of a year at the Home Hospital the girl was able to return to work, and one of the boys who had been working, although he had not obtained his legal papers, was sent to school to complete his education; while the mother and children received the usual instruction and showed great improvement. The woman was fully restored to health. The girl, whose character was previously being molded gradually to fit the slum standard of the district in which she lived and of the egg-packing plant in which she was employed, sums up her experience by saying: "The time I spent in the Home Hospital seems like a year of heaven to me." Her whole outlook on life was changed. There is a personal daintiness and refinement of speech and manner. She has been inspired with fine ideals and a real ambition for improvement, and is now a trusted clerk and telephone operator in a hospital office. The two older boys have good positions, and the family income now amounts to about \$70 a month."

The cost of the treatment of tuberculosis, as thus conducted, is found to be less than that of institutional treatment, and if the same beneficial results are obtained in the next two years the Association believes that it will have pointed out the way to an advance in the control of the disease of the greatest practical value.

128 West 84th Street.

## THE UNDERLYING PRINCIPLE OF ALL TREATMENT.

BY

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The very fact that we are about to institute treatment of any kind presupposes a deviation from an otherwise normal condition.

When a tissue or organ is irritated, either accidentally or by design, there ensues on the part of the living cells a reaction; this reaction we have termed inflammation.

This reaction on the part of the irritated cells is always an attempt to repair the injury which has resulted from the irritation. In other words, it is nature's method of accomplishing recovery from disease.

So far with all the ingenuity of the human mind, no process has been discovered that can even approximately compare with a successful natural recovery.

The truth of this assertion being self-evident and admitted, it must be apparent that any manner or method of treatment that we wish to institute in a given case must be materially influenced by the kind of a reaction nature ordinarily sets up under similar conditions.

In time gone by, inflammation was looked upon as essentially harmful. The fever or inflammation was the principle thing against which the doctor turned loose all his energy; when he successfully lowered the temperature of his patients with the various coal tar derivatives and the patient lived, it was *prima facie* evidence that at least the treat-

ment was right.

This view is, of course, no longer tenable. During the last few years very extensive changes have invaded the domain of therapeutics and are proving themselves advantageous to the patient as well as scientifically correct.

As has been pointed out, all the old cardinal symptoms of inflammation are not at all essential and some of them are frequently absent under modern treatment.

By Bier's method we produce either an active or a passive hyperemia; by the Mikulicz system we develop the resistance period of the individual; by Wright's method the toxines of a specific microbe raise the opsonic index, by the injection of antitoxins we neutralize already formed toxins, by vaccination we prevent smallpox and even typhoid fever.

In all these scientifically correct methods of treatment have we done anything that nature could not have accomplished under favorable circumstances?

There have always been recoveries from disease and more than that, a future immunity has been more or less perfectly established for the individual. If there is any one lesson to be learned from this, it is that the more we are able to assist nature in her efforts, not only better are the results, but as may happen in case of failure, the less is the harm to the patient.

We must remember that while every disease is curable, every patient is not. We are forced to the conclusion that inflammation or fever is a normal and natural reaction to an injury and the right method is not to lessen this process but on the contrary to stimulate and augment that process in the right direction.

If the patient shows any of the signs of an inflammation we may be sure that some-

thing abnormal has occurred in the tissues, something that has caused the tissues to react in that particular manner.

When the surgeon makes an incision, it is not his purpose primarily to reduce the inflammation but rather to remove that something which has caused the inflammation.

If an operation is contraindicated, the physician secures physiological rest for the entire body so that all the systemic energy may be utilized to secure that necessary reaction, in other words, that there may be no waste of energy to reduce the inflammation *per se*, in order that the patient may receive the fullest benefit of that inflammation.

The whole process of physiologic reaction of living tissue to an irritant must of necessity resolve itself into one of three conditions. The reaction is either adequate, inadequate or excessive. Whenever the reaction is adequate there is nothing for the physician to do, for a complete uneventful recovery will follow naturally. The only duty of the physician lies in guiding the patient past dangerous situations and so preventing complications that no interferences to the process will take place. In other words the case is left—and wisely so—in the hands of nature.

It may seem almost paradoxical to say that the great majority of cases of severe inflammation are typical examples not of excessive but of inadequate reaction. The very fact that the disturbance is spreading in extent is in itself an indication that the system is for the time unable to counteract the irritant. The irritant may be excessive but the reaction will be inadequate. When the reaction is inadequate the indications for treatment are *first*, to remove the cause, if possible, *second*, to promote the inflammatory manifestations, and *third*, to aid in

establishing the physiologic reaction on the part of the whole system.

Here we have the rational of the Bier's treatment, which seeks—and in properly selected cases with great success—to so promote the hyperemic exudation and inflammatory reaction in general, that the first indication for treatment will be quite unnecessary. Wright's method of raising the opsonic index is clearly indicated. For ages it has been known in practice that when an inflammation, though locally apparently excessive, was inadequate to discharge the irritant from the body, recourse must be had to poulticing and the employment of hot compresses.

These means were clearly used for the purpose of increasing the local reaction and bringing the inflammation to its maximum.

The surgeon knows very well that frequently a simple laparotomy in local abdominal tuberculosis has given excellent results, when everything else was hopeless. This is another example of inadequate reaction which takes place in local as well as in tuberculosis in general. The simple addition of extra energy manifested to heal the abdominal incision is enough to change an inadequate to an adequate reaction. The result is that the patient recovers.

All the measures so far mentioned have one thing in common, namely to produce one or more of the manifestations of an inflammation.

This inflammation so produced is not a pathological one, but rather a physiological process, a reaction process.

Reaction in excess is the exception and not the rule. In acute cases we note that one factor in the inflammatory process may be unduly exalted as compared with others so that the vitality of the tissues may be imperiled.

For instance, excessive hyperemia may pass on to stasis and even necrosis results. There may be excessive deposits of fibrin or other exuberant granulation tissue with the development of keloids. Such a condition is usually traceable and indicates an idiosyncrasy on the part of the tissues of the individual whereby a minimum irritation has initiated a persistent overgrowth.

It must be remembered that physiological structure and function depend upon the equilibrium of all tissues. This is maintained by mutual restraint between its component cells.

The destruction of a single integer or group of integers of a tissue or even a single cell removes a corresponding amount of restraint at the point injured. So the physiologic equilibrium or balance is destroyed which permits of the abnormal exhibition of bioplastic energies on the part of the remaining uninjured components.

This abnormal bioplastic activity may be a compensating hyperplasia. This hyperplasia is therefore not the direct result of external irritation. It can not be since the action of the irritant is destructive and is confined to the cells that it destroys. It occurs rather indirectly as a function of the surrounding uninjured cells that have been excited to this increased bioplastic activity.

When such a reaction is excessive there is always hypercompensation. There is more material generated than is really necessary to compensate for the actual loss.

In these cases of excessive hyperemia as well as the referred or sympathetic inflammations at a distance removed from the injury, the local application of cold would clearly seem to be the proper practice. Of course the local application of cold is the same as the distant application of heat.

Headache due to some irritant causing

congestion may be treated and relieved as well by the application of cold to the head as by the application of heat to the feet.

Dilatation of the vessels in one part is always balanced by a corresponding contraction in another. We know that fibroid tubercles and fibroid adhesions have eventually disappeared without treatment of any kind, showing that under suitable conditions nature can accomplish even this unaided. We have here a clear indication for such means or measures as will bring about an increased local circulation and so promote absorption.

In casting about for a drug agent we naturally think of potassium iodide and alternatives of that class. Vesicants, rubifacients, heat, massage, passive motion, counter irritants and electricity seem to be indicated as external agents.

From the foregoing it must be apparent that the day has gone by when the physician will be satisfied to treat the name of any particular disease. It must be our aim and object to clearly recognize the pathological changes that have taken place, then study the physiologic reaction that is necessary in any given case.

The selection of the particular therapeutic agent is a secondary consideration, for we must bear in mind that "*It is not the agent, but the reaction to the agent that must be our guide in therapeutics.*"

231 W. 96th Street.

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In earache drop one drop of tincture of aconite upon a piece of cotton, and insert in the affected ear. When the pain is gone remove the medicated cotton and replace it with a piece of warm unmedicated cotton.

—*Medical Summary.*

## ECTOPIC GESTATION; REPORT OF TWO CASES.<sup>1</sup>

BY

H. HORACE GRANT, A. M., M. D.  
Louisville, Kentucky.

Until quite recently the generally accepted theory was that impregnation of the ovum within the tubal lumen, i. e., ectopic gestation, must necessarily be antedated by abnormality or inflammatory disease of the oviduct. At present, however, it is recognized that the oviduct need not necessarily be diseased nor abnormal to make possible

growing impression that more often than otherwise the spermatozoon and ovum unite within the fallopian tube, the products of conception shortly thereafter passing into the uterus. For obvious reasons, however, this is impossible of definite determination in the vast majority of instances.

Granting the premise that fecundation of the ovum normally occurs within the tubal lumen, why in one case the products of conception continue to develop in the oviduct, and in a thousand others pass into the uterine cavity and there continue normal



Fig. 1.

the development of ectopic gestation.

The hypothesis has been advanced by numerous authors that impregnation always normally occurs within the cavity of the uterus, that when it takes place elsewhere the occurrence may be regarded as abnormal or accidental. This theory is insusceptible of adequate demonstration, since it is impossible for anyone to positively say where fecundation should normally occur, i. e., where the spermatozoon should meet the ovum, whether within the uterine cavity or the lumen of the oviduct. There is a



Fig. 2.

development, is also a clinical fact about which little is understood and no reasonable explanation can be offered based upon any hypothesis thus far suggested. When the ovum is fructified within the lumen of the oviduct, provided the products of conception do not promptly pass into the uterus, rupture of the tube may be expected to occur within three months.

Ectopic gestation occurs with such frequency that case reports attract little attention unless containing features of extraordinary clinical interest. The two examples embraced in this report may be

<sup>1</sup> Clinical report before the West End Medical Society, of Louisville, Kentucky.

classified in the latter category, and are therefore presented in some detail.

The specimen herewith exhibited, and which will be later more fully described, is believed to possess more than ordinary interest, although the details in connection with the case differ in no essential respect from many others recorded in literature. The specimen was removed from a female of twenty-one whom I had not seen until she was admitted to the hospital.

Inquiry elicited the history that she had missed one menstrual period, and had suffered with indefinite pelvic pain for about a week before being seen by the family physician. Prior thereto she had enjoyed average health, there being no history of tubal nor pelvic disease. There had been one previous pregnancy which terminated in abortion, the woman never having borne a child.

The patient was brought to the hospital late one afternoon, and I saw her shortly thereafter. According to the history, early that morning there had been a sudden attack of intense pelvic pain, which was referred particularly to the left side. This was immediately followed by symptoms of severe shock; the pulse rose to 140 per minute, and her appearance indicated considerable loss of blood, there being marked pallor and other clinical evidences of exsanguination. This, in brief, is the history given me by the family physician.

Examination after the patient reached the hospital revealed an indefinitely fluctuating mass to the left of the uterus, and from the previous history the diagnosis of ruptured ectopic gestation seemed certain. However, the possibility of pyosalpinx with tubal leakage was also considered.

Celiotomy two days later disclosed the abdomen filled with fluid and clotted blood,

and the fetus which I exhibit was free in the cavity. It will be noted that the funis is still attached to the fetus and imperfectly formed placenta, the remainder of the specimen being the left tube and disintegrated ovary. The fetus is nearly four inches in length and perfect in conformation, the gestation having probably progressed to the beginning of the third month. The operation was performed four weeks ago, and the woman has made a satisfactory recovery.

When I first saw the patient, about twelve hours after the sudden attack of pain, while she still presented symptoms of shock, it appeared that hemorrhage had ceased, and it was deemed wise to await more complete reaction before subjecting her to celiotomy. Even when first seen she might have safely withstood the operation, as her condition was improving, hemorrhage had evidently ceased, the patient being quiet and cheerful. After due consideration, however, it was thought wise to defer operation for a day or two, awaiting a more favorable period. In this particular case the ultimate result certainly confirms the wisdom of the plan pursued.

It is oftentimes a difficult question for the surgeon to decide whether to operate immediately in ectopic gestation, especially where it seems certain rupture has occurred, or await subsidence of shock and a more favorable opportunity. Decision is infinitely more difficult where operation must be undertaken elsewhere than in a well equipped hospital, as aptly illustrated in the second case to be reported.

I have operated upon quite a large number of patients for ectopic gestation, all of whom fortunately recovered. I have seen one case in which the patient was in extremis when first observed, it was nine o'clock at night, five miles from any hos-

pital, and any attempt at surgery seemed out of the question. Extensive hemorrhage had evidently occurred from a ruptured tubal pregnancy, and although rupture had taken place several hours previously, the bleeding still continued.

The difficulties presenting themselves for solution were: (1) should an immediate attempt be made to transport the patient to the hospital; (2) should she be operated upon at once in surroundings unsuitable for aseptic surgery; or (3) should we await subsidence of the acute symptoms and then move the patient to the hospital? After carefully considering the circumstances, it was thought wise to defer operation until the following morning, hoping that hemorrhage would cease in the meantime, and that the patient might then be taken to the hospital for operation with greater promise of a successful outcome. It was believed if an attempt were made to transport her immediately, she would almost certainly perish before we could reach the hospital, and to have operated upon her at home would have been taking the responsibility of subjecting surgery to the additional reproach of almost certain failure. It therefore seemed the wisest course to take the chance of deferring operation. Hypodermic injections of ergotin and adrenalin were administered, the patient was kept as quiet as possible, with the foot of the bed elevated, cold applications were made to the abdomen, etc. However, hemorrhage continued and the woman died about six hours after being first observed.

I have never reproached myself for the decision at which I arrived in this case. The patient was in collapse when first seen, it would have taken at least three hours to get her to the hospital, she would most likely have died on the way from increased shock incident to transportation, and a fatal

result would have undoubtedly ensued had operation been undertaken in the unfavorable surroundings at her home.

Various authors, especially Hunter Robb, of Cleveland, Ohio, have attempted to maintain the position that in every case of ruptured ectopic gestation hemorrhage will cease after the expiration of a few hours, and if quietude of the patient is maintained there will be an interval of reaction during which the operation may be safely undertaken. That this observation is not always literally true is amply illustrated by the foregoing report; at the same time we know that reaction does occur in the great majority of instances, as shown in case one. On the other hand, many patients perish from continuation of the hemorrhage, and the same result is likely to occur from operations undertaken in unsatisfactory surroundings; therefore a tremendous responsibility is assumed by the surgeon when he attempts to decide just what should be done. Under circumstances such as described in the latter case, I believe it is better to give nature a chance rather than that surgery should invariably bear the odium of a fatal outcome.

**The Elastic Ligature in the Non-Operative Treatment of Fistula-in-Ano.**—An elastic ligature is very efficacious as a non-operative treatment in complete fistula, provided there are no ramifications. An ordinary probe with an eye at one end is passed through the fistula and an elastic band is then threaded through the eye of the instrument. The elastic is then drawn through the fistula and the two ends tied loosely over the skin. In a week to ten days the elastic cuts through the roof of the fistula, leaving an open wound that is treated as one made with a scalpel. The patient suffers no pain except a slight "sticking" when the bowels moved.—*Int. Jour. of Surgery.*

**FETICIDE.**

BY

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Human life is the most sacred thing in the world. So deeply is this fact grounded in our very being or nature that all civilized nations have enacted stringent laws protecting human life, and prescribing severe punishments for those who destroy it. In spite of these facts there is a misapprehension on the part of some, and an evasion on the part of others, as to the time in the development of the human being when these legal enactments and moral obligations become operative and of binding force. Human life, with all the potentialities of the fully developed human being, begins just as soon as there is a vital union of the male and female generative elements, and the destruction of this life, no matter how lowly the form nor early the stage of development, is just as much the destruction of a human life as it is to kill an infant, a child, or an adult. (Abstracted from Stuver, et al., 1906).

The foregoing introductory paragraph appears especially *ápropos* at the present time, in connection with the alarming social and criminal conditions developed by the investigations of the so-called "vice commissions" in several large American cities. It will be remembered that not long ago the startling fact was revealed that in the city of Chicago alone over sixty thousand criminal abortions were procured in a single year; and more recent investigations amply demonstrate that conditions not dissimilar in any essential respect exist in New York, Boston, Philadelphia and other cities. All the thus far obtainable suggest the inevit-

able tendency of modern ultra-civilization toward gradual race extinction through intentional abortion.

Feticide and intentional (or criminal) abortion are unmistakably synonymous and interchangeable designations, essentially representing a premeditated and deliberate act having for its ultimate object artificial expulsion of the fructified ovum from the uterine cavity of the *genus homo femininis* regardless of the period of gestation, literally from the moment of conception to normal term, and solely for the purpose of preventing the birth of a living human being.

Study of the literature induces the inevitable conclusion that no country nor nationality has ever been entirely exempt from the abnormal occurrence under consideration, feticide having been practiced or procured among civilized married and unmarried females with greater or less frequency in every quarter of the globe since the beginning of historical records. On the contrary, however, so far as can be ascertained the people of no strictly savage race appear to have been proven guilty of intentional abortion, although infanticide has always been common among the uncivilized.

Here, indeed, is a perversion of nature; maternal sympathy, care and tenderness are withheld, and harm is plotted for the child by the mother who has failed to do her duty; the parents who have sworn to the obligation of wedlock conspire to kill their child, while the lioness will bleed and fight to the death for her cub; the rough hand of the uncouth savage becomes soft to his babe; motherhood among all higher animals means care and tenderness, self-sacrifice and love; but the degeneration found in some phases of social life, which

replaces ethics and religion with lust and lasciviousness, has given to the world a most perverted type of nature's craft. (Weaver). This certainly constitutes a strangely incongruous commentary upon social ethics and the multitudinous virtues presumed to accrue from the advanced enlightenment incident to modern ultra-civilization!

It is conservatively estimated that, in this country at least, one-half of all pregnancies are terminated by abortion, the majority being deliberately and intentionally procured, whether the prospective mother be old or young, married or single appears of little importance. As a matter of fact it is claimed by certain authors (Scott et al.) that seventy-five to ninety percent of criminal abortions are procured by married women. One writer (Van Goidtsnoven) declares that criminal abortion is so universally in vogue that it may well be termed a national vice, for the commission of which the physician is eulogized by the patient and applauded by his friends and colleagues; and (according to Swayne) husbands seek it for their wives; libertines ask it for their mistresses; seducers seek it for the unhappy victims of their licentious passions; wives—aye! mothers, even—beg it for themselves; and physicians there are who advise and practice it not only as a *dernier resort*, but as an expeditious means of relieving nausea and vomiting in pregnancy, and therefore call it justifiable!

Reference to medico-legal literature, however, is unnecessary to prove that intentional abortion is being openly or secretly practiced in nearly every civilized community, since the aid of every physician of average experience has been repeatedly invoked to relieve suffering incident to the after-effects thereof. It is presumed that

ordinarily those who for monetary considerations contract to "open the womb of the pregnant"—thus effectually terminating utero-gestation—are not legitimate practitioners of medicine, therefore after destruction of the fetus has been accomplished the woman wisely invokes the immediate aid of one who is legally qualified to institute rational methods of procedure having for their object the conservation of maternal life. However, be it said to the everlasting discredit of the profession, intentional abortions are sometimes produced by those who have subscribed to the Hippocratic oath, even though unnecessary for the conservation of maternal life.

Not many years ago feticide was practically unknown in rural districts, but the recent multiplicity of railway and trolley-line facilities have brought urban and suburban communities into such intimate geographical relationship that any married or single female desiring termination of an unwelcome pregnancy, and not possessing the requisite instruments with definite information concerning their successful employment may have her wishes gratified by traveling a few miles; and if the operator be an expert and the gestation not too far advanced, in the majority of instances she is shortly able to resume her former position in society and the household.

The experience is not unusual for educated one-child mothers to disclaim any intention whatsoever of being handicapped in their progress toward the acme of advanced social achievement by the bearing of additional children, and boast of having been numerous times under the "treatment" of the celebrated infallible "Doctor B." because of menstrual irregularities and interruptions. Some mothers unhesitatingly admit having patronized the professional

abortionist more than a dozen times after giving birth to one living child, thus affording an adequate explanation of the multiplicity of instances in which so-called one-child sterility exists.

In the event a newly married female invokes the aid of the abortionist so soon as pregnancy ensues, which is commonly the first or second month after the consummation of marriage, she is usually thereafter rendered incapable of bearing a living child. "Should the woman survive repeated abortions, the resultant unstable neurotic condition superadded to the physical and moral degeneration which such unnatural processes induce, almost invariably renders her thereafter incapable of carrying a fetus to normal term, if indeed irrevocable sterility be not thereby produced."

Under the circumstances cited, i. e., childless marriages and one-child sterility, it has hitherto been customary to place the entire burden of responsibility upon the husband, the hypothesis being that at the time of marriage he was the victim of an uncured specific (Neisserian) urethrhea (so-called gonorrhea, urethritis, etc.) and immediately transmitted the infection to his connubial partner, thus rendering her thereafter sterile. The average physician appears to have overlooked the pertinent facts: (a) that prolonged existence of specific (Neisserian) vagino-urethrhea (so-called gonorrhea, vaginitis, etc.) is practically impossible without characteristic symptoms being demonstrably present; (b) that the female may at no time have exhibited the slightest evidence of active venereal disease; (c) that the husband having been cured of his specific urethrhea could not have infected his wife; (d) that she alone may be responsible for her sterility for the reasons already enumerated. In the major-

ity of such instances primarily the female was potentially fertile, but was rendered practically sterile secondarily by repeated induced abortions.

Not infrequently the females who procure or practice intentional abortion belong to the wealthy and so-called aristocratic class, being most highly respected in church and social circles, devoutly worshipping their favorite Deities in public, and as religiously sinning against them in secret! Thus it happens that the rich and educated who could well afford to rear children have them not, whereas the poor and ignorant who are unable to support them are often-times overburdened with progeny because they know not how to prevent conception nor to contravert the inexorable laws of nature; and children thus born perforce remaining equally poor and ignorant are frequently added to the list of undesirables, viz.: the criminal and degenerate classes. However, previous writers have distinctly erred in attempting to maintain the hypothesis that the intangible and imperfectly understood influence of heredity is solely responsible for such mental and moral obliquities, since adequate explanation therefor may be found in the unfavorable environments which necessarily surround the lives of children so born. The interpolation of a personally observed illustration may be permissible although not particularly pertinent.

After having visited the white lights of a great city one reached by one of the numerous trolley lines, a poor and ignorant family in the country became imbued with the idea that existence would be more agreeable and education of their children facilitated by migrating thereto, and accordingly the farm which had hitherto afforded them a competence was sold. The meagre earn-

ings from daily labor barely permitted two living rooms in the city, which had to accommodate four persons, viz.: the father, mother and two children, a boy of ten and a girl of eight, the children sleeping together in one room, the parents occupying the other. Hope was strong for prosperity and better quarters, but fickle Dame Fortune refused her smiles, education of the children became impossible, and the scant income barely afforded a living. At fourteen the sister was impregnated by her brother, and the resulting domestic disquietude may be better imagined than described. The mother took her pregnant daughter to the abortionist so soon as the signs of gestation became unmistakeable, which was not until about the end of the fourth month. After a stormy convalescence the girl finally recovered, but the family had faced social, moral and physical disaster, all of which might have been prevented.

In connection with the foregoing it may be permissible to state that the one-child society mother not infrequently instructs her daughter (married or unmarried) in the art of inducing abortion or in successful methods of preventing conception. It is recognized, however, this statement is not in accord with the views of previous writers who claim that even educated people know nothing of the methods by which abortion may be produced. For instance, Connelly declares that his experience with pregnant women has been that many desired abortion, but he has yet to find an individual capable of producing an abortion upon herself. "Abortions are spoken of as being performed with great frequency and great success among the most enlightened on this subject, but the medical profession does not find it so. . . . The physician has to

use his utmost skill in the treatment of a miscarriage. How can the unprofessional be so successful in their forced abortions? I do not believe these abortions take place so frequently, because people don't know how to produce them. This talk about mothers teaching their daughters is rank nonsense, as the mother knows nothing more than what she has heard. There is but one possible method of producing abortion open to the laity, viz.: by the introduction of a sound into the uterus, and I'll defy the vast majority of women to accomplish it." (Connelly).

It is presumed this learned gentleman is duly authorized to express the views of the entire medical profession, at least that is the inevitable inference to be drawn from his remarks. However, extensive experience is unnecessary to demonstrate the fallacy of his statements as to reasonably substantiate the contrary hypothesis that, after having many times patronized the professional abortionist, women have become expert in the employment of the requisite instruments for procuring abortion, and instances are not unknown where they have secured and furnished their daughters duplicates of these instruments with *minutiae* as to the *modus operandi* by which abortion may be successfully accomplished. And in the event of failure, there always remains recourse to the infallible "Doctor B." whose treatment so frequently relieved the mother under similar circumstances.

"Could we but lift the veil that conceals the many premature graves, the shattered lives and desolate or disrupted homes—homes from which the bright smiles and ardent hopes of young lives have disappeared forever, and in their stead reign desolation, sorrow and vain regrets—a deso-

lation that all the wealth and honor of the world can never satisfy—a sorrow that can never be appeased, and regrets that no amount of sophistry nor excuses can remove or mitigate—could these things be presented in the noonday glare of all their physical and moral hideousness, how soon would the aroused conscience of a moral and Christian people drive to their proper place behind the prison bars the vile hags that suggest this crime (feticide) to young women and teach them how to commit it, or do the foul work themselves; or those still worse vampires who wear the livery of an honorable profession to cover their infamous practices, not to say anything of the base, conscienceless libertines who assist in the accomplishment of this nefarious work, and at the same time retain their so-called exalted social positions." (Stuver).

Much of this wholesale and cowardly murder of innocent and unprotected children has been done viciously, but more has been done ignorantly through misconception of the nature of the crime and recklessly through misinformation about its deleterious and multitudinous consequences. (Haggard). What is a greater crime than the murder of a child while yet in the womb? The question startles us, but nevertheless the crime is being committed in spite of all laws. (Horne).

Someone has rightfully said that there exists no law by the invocation of which a woman can be compelled to bear children unless she subject herself to the process by which they may be engendered, and Van Goidtsnoven adds: The child has a right to be born; he is not an aggressor: he took no part in the sexual congress which resulted in his existence. Whether the sexual congress was licit or otherwise, the embryo is a *de jure* as well as a *de facto* issue of a

concurred act; he is therefore neither an invader nor an intruder; the responsibility of his *fiat* and subsequent *ego* reverts to or rests with the authors of his conception. A child, whether it be an embryo, a fetus, or a fully developed babe, has under all circumstances a legal and moral right to its life, and ought never to be deliberately killed.

The foregoing statements are equally applicable whether the female be married or single, the daughter of a banker or a peasant. However, the writer is not unmindful of the fact that the views expressed herein are distinctly at variance with the ideas of certain distinguished German authors (and if he be not mistaken there are also several such in America) who advocate return to the ancient Roman laws which specify that the fetus is a part of the mother's viscera (*infans pars viscerum matris*) and therefore she alone has the unalienable right to decide whether it shall be preserved or destroyed.

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## INTESTINAL DISINFECTION.

BY

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During the past 20 years much valuable information has been published on the mechanism of immunity; but although it is now well known that all infectious diseases are caused by germs, comparatively few attempts have been made to destroy these causal agents of disease in the human body. This is the more surprising in view of the successful work of Ehrlich with dioxydiamido-arseno-benzol in the disinfection of the spirochaeta pallida.

As Somerville<sup>1</sup> has pointed out, "There are those who still regard the attempt to disinfect the human organism as futile. And some of these appear to believe that the only method of meeting the disasters produced by pathogenic bacteria is to train the tissues to cultivate the appropriate antibodies. These views appear to me to be somewhat extreme. Many cases of infection occur in which intensity of toxins is so great that the

lich and Hata is bright."

On the other hand, so great an authority as Fränkel<sup>1</sup> has declared that "the ideal purpose, to find an antiseptic which can be used internally, so that it destroys the bacteria within the organism, without damaging the same, is certainly unattainable, because all substances possessing antiseptic properties, possess also poisonous characters, which property is inseparable from



McDonald's Duodenal Tube.

organism is unable to prepare the necessary antibodies. Previous use of disinfection might have so attenuated, if not destroyed the virulent organism, that the body would have been able to respond with the necessary quantities of antibodies. . . . The outlook for internal disinfection, or chemotherapy, along the path opened up by Ehr-

their antiseptic power." The object of the present note is to convince those open to conviction that these views are no longer tenable, at least in so far as they apply to intestinal disinfection.

Of past attempts to bring the contents of the alimentary canal under the influence of disinfection, little need be mentioned here,

<sup>1</sup>Cantor Lectures, 1913.

<sup>1</sup>"Die Arznei-mittel Synthese."

beyond the fact that of the long array of chemical reagents and other substances put forward from time to time in the hope of solving this problem, all fail in one or more respects to fill the requirements which are now known to be essential to the successful action of an intestinal disinfectant. These requirements are tersely set forth by Assmann,<sup>1</sup> as follows:

- (1). "It should have a strong germicidal action.
- (2). It should be relatively non-toxic for the body as a whole, and harmless to the intestinal mucosa.
- (3). It should be absorbed in small amount.
- (4). It should suffer no chemical changes whereby it loses any of the above requirements.
- (5). It should be so constituted that it mixes freely with the intestinal contents, and therefore be freely soluble."

The writer has for many years taken a hopeful view of the outlook in this particular field of applied chemistry, and has always felt convinced that the solution of the problem would come with the introduction of a suitable drug, combined with new and improved methods of application. Recent research has brought to light a chemical product which fills all of Assman's requirements; this, with the introduction of the "duodenal enema" of Dr. Ellice McDonald, and, at his suggestion, the application of the new product by this method, made disinfection of the intestinal canal at once possible. Particulars of McDonald's tube as employed in connection with the duodenal enema will be found in the *Medical Record* for July 18, in a paper dealing with the Toxemia of Pregnancy, from which the following is extracted:

"During the last 18 months I have treated twelve cases of toxic vomiting of pregnancy

by means of a duodenal tube, which is a modification of the Jutte tube. The procedure is as follows: A small rubber tube about the caliber of 12 F is thrust into the stomach after the pharynx has been anesthetized by a local anesthetic spray. Most patients are able to swallow the tube themselves after the first treatment, but at the first attempt, in order to maintain the patient's confidence, it is better to cocaineize the throat and insert the tube with the patient sitting up in a chair. The tongue is depressed with the forefinger while the tube is thrust down with the other hand, the patient being advised to breathe deeply and slowly, in order to prevent any nausea. When the tube is down about 22 inches, 8 ounces of a solution of sodium chloride, in amount a trifle stronger than the physiological solution,<sup>1</sup> is injected by means of a syringe through the tube into the stomach. This usually effectually neutralizes the tendency to vomit. The tube is then thrust further down to about the length of 28 inches. The patient is then placed upon her right side in a semiprone position. The waist bands should be loosened. After a few minutes, suction is made by means of a vacuum bottle and syringe to withdraw some of the contents through the tube. When bile or intestinal juice is obtained, it is considered that the tip of the tube has passed the duodenum.<sup>2</sup> It is needless to say that the stomach should be empty for several hours before the treatment is done. It is usually possible to pass the pylorus within five to seven minutes. An injection is then made by means of a gravity can of a liter of a solution containing from four to six drams, by measure, of granulated sodium sulphate. This solution has the effect of precipitating itself through the intestines; within thirty minutes from the time the last of the sulphate solution is introduced into the tube the first of it appears at the anus. . . . The duodenal tube should be of a very good quality of rubber, which is difficult to

<sup>1</sup>About one dram to the eight ounces of water.

<sup>2</sup>Subsequent work, with the aid of the X-ray, has proved that obtaining bile does not always indicate that the tip of the tube has passed the pylorus; in other words the presence of bile may show only that relaxation of the pyloric sphincter has occurred; this condition however is sufficient to admit of a successful result.

<sup>1</sup> Ztschr., f. Tiermed., 1911, xv, 122, 264, 352.

obtain in this country. I have my tubes made in Paris with an apical as well as a lateral aperture and of the caliber of 12, 13 and 14 F."

For further proof that the end of the tube has passed the pylorus, the following methods recommended by Palefski<sup>1</sup> may be applied:—“(a) Aspiration of a specimen of clear, neutral, and bile-colored duodenal contents following a previously aspirated specimen of colorless hydrochloric acid contents, is positive evidence that the tube is in the duodenum, as a specimen of regurgitated duodenal contents is always turbid and usually acid in reaction, free hydrochloric acid being present. (b) Upon inflating with a bulb attached to the outer end of the duodenal tube, if the latter is still in the stomach, the epigastrium will become distended and tympanitic and the patient will experience discomfort *followed by immediate belching*. On the other hand, if the tube is in the third portion of the duodenum or beyond this point the lower abdominal quadrants will become distended and tympanitic; the epigastrium will become depressed, and the patient will neither belch nor experience any discomfort whatsoever.”

It was realized in the earlier part of the work which led up to the results described in this paper, that however efficient the disinfectant might be, no method of application could bring about the desired result which did not provide for the partial distention of the canal with the object of straightening out all kinks and bends, and exposing the decomposing matter which might otherwise escape the treatment. It was this fact that led the writer to adopt McDonald's duodenal enema, with its litre of sulphate solution.

Many experiments were made with

various disinfectants offering a reasonable hope of success, but it was only when the chemical product above referred to was evolved in the writer's laboratory that this hope was realized. The active principle of the new product is trimethyl-methoxy-phenol, C<sub>6</sub>H (CH<sub>3</sub>)<sub>3</sub>, (OCH<sub>3</sub>). OH, and experience has shown it is best used in the form of a gelatin emulsion. This emulsion has a Rideal-Walker coefficient of 20 for *B. typhosus*, but in spite of its great strength as a bactericide, it may be used freely in all dilutions necessary to insure complete disinfection, without injuriously affecting the intestinal mucosa.

In the following experiment which was conducted independently at the New York Laboratory of Dr. Frederick E. Sondern before a number of prominent medical men, the patient, after McDonald's tube had been introduced by the mouth and bile pigment had been obtained, showing the relaxation of the pylorus, was given 1 litre of the sodium sulphate solution to which 5 c. c. of the gelatin emulsion above referred to had been added; this solution, it should be noted, is equivalent in bactericidal efficiency to 10% pure phenol. The time occupied in running in the solution was about 10 minutes; this was regulated by interposing a short length of stout glass tubing with  $\frac{1}{16}$ " bore. The result will be seen from the following report. The feces were collected in three portions, the first of which was rejected as it was considered that this could not have come within the influence of the disinfectant; Nos. 1 and 2 in the report should therefore read 2 and 3. Glucose agar was selected for this work in view of the fact that *B. coli*, *proteus*, *putrificus*, *sporogenes* and other indogenous bacteria grow freely on this medium. Dr. Sondern's report is as follows:

<sup>1</sup> *Medical Record*, April 18, 1914.

*Report No. 55414.***Tests of Efficiency of New Fluid for Intestinal Sterilization.**

**Technique:** Feces collected in two portions (Nos. 1 and 2) in sterile receptacles. Each portion filtered under sterile precautions and cultures made from filtrates on glucose agar plates, previously poured and incubated to prove sterility.

Cultures incubated for 24 hours at 37.5° C.

**PLATE No. 1.**

- A. 1 c. c. filtrate: No growth.
- B. 1 c. c. 1:100 filtrate: No growth.
- C. 1 c. c. 1:1000 filtrate: No growth.

**PLATE No. 2.**

- A. 1 c. c. filtrate: Pure growth of Gram positive coccus producing lemon yellow pigment. Count not possible, owing to partial liquefaction of media. *B. coli* not present.
- B. 1 c. c. 1:100 filtrate: No growth.
- C. 1 c. c. 1:1000 filtrate: No growth.

New York, 22 June, 1914.

The Clinical Laboratory,  
200 W. 56th Street.

No attempt was made to determine the bacterial content of the solid particles, as in the opinion of the writer sterilization of the interior of these particles is not only absolutely impossible, but wholly unnecessary. The fact of the fluid contents of the canal being sterile may be taken to indicate that the exterior of all solid particles is in a like condition, and therefore harmless. It is the organisms in the fluid portions only that produce the deadly effects through the chemical substances they secrete; those in the interior of the solid portions (i. e., as evacuated) may be disregarded, as they are not available for good or evil.

Woolworth Building.

**THE ANNOTATOR**

**Barber Surgeons of Egypt.**—Lord Kitchener has inaugurated the plan of using the barbers of Egypt as vaccinators, sanitary inspectors, reporters of infectious diseases, and also to render first aid and to treat simple complaints. That is a rather large order and assumes a higher grade of education and intelligence than the barber possesses in any part of the world especially among the stupid peasantry of Africa. We have plenty of negro doctors here but they are mostly mulattoes or quadroons or indeed so white that it is hard to believe they are negroes at all. In medieval times when the barber did all the surgery, he went through a long apprenticeship and as far as we know he was a man of more than usual ability. At present the barber is able to perform his work after a very short apprenticeship, and needs no education whatever. He seems to get as large a wage as an educated man, so what is the use of the three R's to him? The result is that we have a body of artisans who with some exceptions are not capable of being trained to do these various other things. Still if Kitchener succeeds with his peasants, Europeans also should. There is really no reason why the barber should not add to his income by taking up side lines except surgery and they are dealing with too many skin infections to be trusted as vaccinators. It would attract a higher grade of men to the calling and perhaps we would contract fever infections in barber shops. Nor can we see any public necessity for utilizing either barbers in surgery or pharmacists in medicine, and the drift of the evolution of civilization seems to be leaving them the practice of their limited specialties and nothing more. In spite of this drift, there are not a few physicians who have advocated a third profession somewhat similar to the chemists of Europe who occupy a decidedly higher position than the drug sellers who are not permitted to compound pre-

scriptions, and can be trusted in minor illnesses. If we really need such an adjunct profession the colleges can supply the men and after a proper course of study can issue a limited degree as they already do to doctors of public health. We can at least give instruction to barbers to avoid infection even if they never can do phlebotomy again.



**Is Moonlight Dangerous.**—The alleged harmfulness of moonlight is at last receiving scientific attention. It seems, according to a writer in *The Chemical News* of England, that the light of the moon being reflected, is polarized; that is, the vibrations are in one plane instead of all planes as in light coming directly from its source.

It is also said that it has less germicidal power than direct light and that decay is therefore quicker. All this may be true and it may explain some of the folk lore as to moonlight. We have so long believed these tales to be the myths of primitive peoples, that we are not inclined to take any suggestions in this line seriously. Nevertheless universal beliefs are based on observations of some sort. They are really mistaken attempts at the scientific explanation of phenomena, noticed for the first time. Sometimes, if not generally, mere coincidences are coupled together as cause and effect, and often real correlations are discovered as in the case of many of our standard drugs. The matter of moonshine then may not be so foolish as we now believe, and though we cannot imagine anything practical to come from a study of it, yet it should not be neglected. The folktales, by-the-way, seem to have originated in lands of very clear atmosphere, and it is extremely doubtful whether in these northern misty climates moonlight has any ocular or nervous effect one way or the other. Still we are often surprised at the facts elicited from still more bizarre investigations. Surely polarized light must have injurious retinal effects, and it might be well to find out that much.

**Conquering Malaria.**—The great reduction of malaria in our south, as reported by the Public Health Service, is a matter of national congratulation. It is said that the warfare against mosquitoes diminished these fevers in 1913 to one-third their former rate. No greater proof is needed of the splendid achievements of modern sanitation. The elimination of the breeding places was ridiculed as a fad only a few years ago, and is still misunderstood by the ignoramuses, but the intelligent majority urge that this work be prosecuted vigorously by the health authorities. The world moves more quickly than generally believed. It is not too radical to predict the complete conquest of malaria in the United States. What is now needed is an extension of the campaign to every household, to the end that each family will feel itself in duty bound to look after its own premises and immediate neighborhood. A clogged rain gutter may supply the adjoining houses with enough mosquitoes to nullify—all the season's work in the community at large. That is, this nuisance is largely a strictly local one; only occasionally are we bothered by insects blown from distant places. When we think of the serious after effects of long continued or repeated malarial infections, particularly the possibility of the activation of tuberculosis which would otherwise remain latent, we can well understand why the general health conditions are so vastly improved in our south.

**The Diminishing Fourth of July Surgery.**—A few years ago no family physician dared to take a holiday on the fourth

of July, because he knew his services would be in constant demand that day to patch up the youngsters who had been more or less blown to pieces. The crusade for "a safe and sane fourth" has borne good fruit for the people and diminished our income in a way we our-



selves have advocated. Strange phenomenon! The medical profession which thrives on the misfortunes of other people, is foremost in the fight to prevent these misfortunes and drive itself out of business. Physicians best know the evils of the world and are hard at work trying to remedy them. They have helped along the movement for a sane fourth of July. The *Chicago Herald* says that there has been a steady reduction of deaths from 215 in 1909 to 18 in 1914, and we can presume that the non-fatal accidents have been reduced proportionately. That is, there are now less than a tenth of these emergency calls than six years ago. Physicians are no longer tied to their offices on the fourth of July and can take a holiday to renew their own patriotic emotions.

**The Decay of Ancient Greeks.**—The anthropological views of Victor C. Vaughn were stated in his presidential address to

the American Medical Association in Atlantic City, June 23, 1914. If there is anything apparently settled it is the fact that the people who built what is called the Homeric Greek culture, were conquering tall blond invaders from the north,

and that being physically unfit for such a climate they died out after a few generations. By the time of the Roman Empire they were completely forgotten by the surviving the brunette autochthones who being of smaller stature and less intelligence had been enslaved and kept on the farms. Hippocrates mentioned the victims of tuberculosis as being mostly blond blue eyed types which do not exist in modern Greece. In spite of this, Vaughn approves Thumb's conclusion that modern Greeks are the lineal descendants of the men who established the great ancient civilization we call Homeric. Excavations show that there had been a succession of cultures, each literally built on the ruins of a prior one, and going back to the first stone age, but the Homeric was the highest and the only one which left written records. Other diseases as well as tuberculosis were nature's instruments for the elimination of unfit mi-



grants, but it is doubtful whether malaria was as potent as Sir Ronald Ross claims. It did not eliminate the natives and has probably existed for millenniums. At the date given by Vaughn for the introduction of malaria into Greece, the Homeric Greeks had about disappeared, at least only some decrepit specimens remained. Medicine was degenerating into speculation and the whole civilization was decaying. Contagion as a rule is much more fatal with weaklings, in spite of the fact that typhoid fever seems to prefer the strong and robust. Such matters have only recently been put to the test of statistics and do not sustain the contention that infections eliminate the fittest or even the strongest.

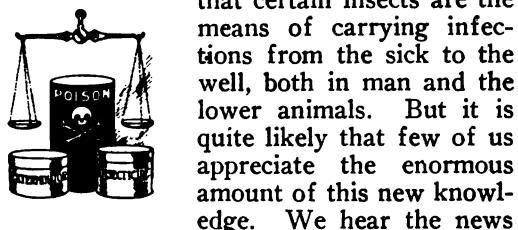
**Poverty Cannot Be Abolished.**—The impossibility of abolishing poverty does not seem to dawn upon our charity workers,



and as sickness and poverty are linked together each being cause and effect of the other, it behoves us as a profession to look into the matter a little. In a recent article in *Pearson's* magazine, Charles Edward Russell goes over the various reform measures which have been taken up from time to time to raise the standards of living and shows that they have all failed, and then without a thought as to the nature of this natural phenomenon of the struggle for existence, he suggests a socialistic scheme of his own to accomplish the impossible. What we must keep constantly in mind is the fact that more babies are born than can possibly survive. A few minutes' calculation will show that with the present birth rate, the population in a few centuries will be so dense on earth that there would not even be standing room. Populations then invariably crowd the food supply. People must compete for the available food and the least fit for the struggle go hungry as in all the other species of animal. We have frequently mentioned the fact that the markets of New York City do not contain enough nitrogenous food to prevent the development of tuberculosis,

and yet we constantly hear optimistic predictions of the future conquest of this disease. Cure is now conceded to be largely if not entirely a matter of money and is out of reach of the unaided poor. Prevention is still further out of their reach because we have not sufficient food to give them. Even if we could tax ourselves enough to buy it for them we would deprive some one else of it.

**Insect Carriers of Disease.**—Everyone now knows that the investigations of the last eighteen years have definitely proved



that certain insects are the means of carrying infections from the sick to the well, both in man and the lower animals. But it is quite likely that few of us appreciate the enormous amount of this new knowledge. We hear the news piecemeal and rarely get a summing up. It will therefore be news to most people that at least ten kinds of insects are either known to be carriers or so strongly suspected as to leave little doubt of their guilt;—mosquitoes, fleas, body lice, bed bugs, sand flies, Buffalo gnat, biting stable fly, domestic fly, a gnat, tsetse fly and the itch mite. As there are several species of mosquitoes, fleas and lice involved, the number of carriers is between fifteen to twenty. This represents an enormous amount of work, and also an enormous amount of prevention in the following diseases,—yellow fever, malaria, plague, cholera, typhoid, Malta fever, summer diarrhea, dengue, filariasis, surra, relapsing fever, typhus, Texas fever of cattle, Rocky mountain fever, sleeping sickness, poliomyelitis, kala-azar, anthrax and a host of suppurations, ophthalmias and short fevers resembling influenza. Perhaps pellagra, leprosy, hookworm and beriberi might have a relation to insect carriers. This is so important to the welfare of mankind, that there has arisen a world wide campaign against all insects in or near our dwelling places. Of course, we cannot exterminate them, but we can confine them to uninhabited places. We are drifting to an insect free era. If we will not help voluntarily we will eventually be considered public enemies and treated accordingly.

**The Subway Inferno.**—The subway heat has been so great during the past summer as to have caused considerable injury to the health of passengers, if we can believe the comments which are occasionally voiced. The ventilating engineers have miserably failed as we have previously mentioned, and it now seems that the time has come to compel a more decent regard for public health.

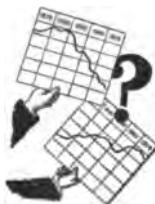
The development of the city is progressing along lines which render a vast multitude absolutely dependent on the subway to get to and from their work, and the travel must be made comfortable even if there were no evidence that it is dangerous to health. We can reject the claim that the bad conditions are irremediable. Far more intricate problems have been solved. It is merely a question of hiring the right kind of men to devise the method and machinery, and then paying for the installation. It can be done and must be. We do not pretend to say how this shall be done; but it seems evident that forced draught is the only solution. All the arrangements to induce hot air to flow out and cool air in, have miserably failed. Now let us hear what are the obstacles. It seems to be a matter of cost and the possible reduction of dividends, but public health is a little above such considerations, and it is difficult to believe that the cost is prohibitive. Why not experiment further with powerful air pumps to force cool air in, and keep at it in a few sections until we do succeed.

**Safer Railroad Travel.**—The increasing safety of railroad travel is shown by the report of the Pennsylvania Railroad that of the 87,000,000 passengers carried in the first six months of 1914, not one was killed. In the lines east of Pittsburgh no one has lost life since 1912. Safety appliances have reached a point of efficiency which indicates the gradual elimination of the human element. That is, the arrangements are so made that the errors of a tired brain are automatically



checked by some mechanism. A train cannot pass a stop signal or a switch cannot be thrown wrong. Of course, the human brain is still above all and errors must occur but it is a satisfaction to know how harmless they are becoming. If any railroad has a series of fatal accidents it must be due to criminal neglect to adopt modern safety devices. Is it not about time to take criminal action against owners, directors and managers, when avoidable wrecks occur? There is evidently more need of protection of employees. President Lee of the Trainmen's Brotherhood said in June, 1913, that one of their number was killed or injured every six minutes day and night, year after year. They claim that the adoption of automatic appliances has so increased the number of cars per trainman, as to increase his risk unduly. The machine is too big for the fewer running it, and their errors are correspondingly multiplied. Of course the percentage of men who meet accidents is progressively lessening all the time, but the total are still appallingly high.

**Has Cancer Increased?**—The controversy over cancer mortality rates has left us rather bewildered. Equally able statisticians have studied the same figures and come to opposite conclusions, one side maintaining that the percentage of deaths has not changed in recent years but the other concluding that there has been a



marked and alarming increase and in every age period of life. The 1914 report of the British Imperial Cancer Research Fund states that all statements of the increase of cancer as a whole could be ignored. Incidentally it says there are no "cancer houses." All this is very comforting as some of us are getting old and we do not like to feel that the diseases of old folks are getting more numerous as though we had overstayed our earthly welcome. The remarkable prolongation of life had made many people fear to grow old because so many were dying of sheer old age, but the cancer specialists had almost convinced us that civilization was opposed to our growing old. All this is changed now.

With the exception of the big plagues, now a thing of the past, diseases seem to kill us much the same as they always have and according to our age. The increasing accuracy of statistics deceives us as to their relative prevalence. Medical statistics are more than unreliable. They are positively immoral in the way they lead us into false conclusions. Similarly a certain percentage of us seem destined to die of trauma, in one age our neighbors stuck knives in us, in another they fired bullets into us, and now they run over us with automobiles. The "safety first" campaign is sure to lessen the awful loss of life by preventable accidents, only to die later of the unpreventable. The time when we are all to die of senility seems as far off as ever.



**Abdominal Rigidity.**—Roux (*Revue Médicale*, May, 1914) points out the distinction between different grades of abdominal rigidity. Mild grades result from a variety of causes, including fear and simulation, and are devoid of pathological significance. Marked rigidity, board-like abdomen, retraction, or contracture arises through traumatism or is spontaneous. After traumatism, the boardlike condition may be present or not exist, whether the viscera are intact or injured. Seemingly it may be wanting where there is crushing of muscle tissue locally, or very marked where there has been local irritation of mild degree, provided this irritation has arisen in situations where nerves abound. While the degree of rigidity is frequently proportionate to the trauma, it never supplies information that permits one to reach a conclusion as to the state of affairs behind the abdominal wall; the detailed case history, percussion findings, signs of hemorrhage, and the patient's general condition must also be taken into account. Thus, after traumatism, rigidity is generally devoid of practical value. A spontaneously arising boardlike condition, however, is a very certain and important indication for operative intervention. While this condition does not invariably arise in cases of visceral rupture or inflammation, its presence should always suggest intense local irritation, due usually to the effects of gastric juice or the contents of the small intestine just below the pylorus, escaping into the peritoneal cavity through a perforation. Only in very exceptional cases, the author having met with but

one, does the boardlike condition fail as an indication for operation.

**Etiology of Colds.**—The infectious nature of common colds has been so frequently asserted, that it would be well to consider them such even if purely physical causes such as "chilling," cause a condition of the system in which the ever present pathogenic organisms have a chance to grow. Several years ago colds were investigated by the Boston Chamber of Commerce Committee on the Prevention of Disease. The secretary, Dr. James A. Honeij, reported the following summary and conclusions in the *Boston Medical and Surgical Journal*, April 27, 1911. Surely it is time to do something to end these dangerous "minor ailments."

**Summary.**—1. Over half the population have colds during the course of the six months.

2. One-fifth of the population are absent from work on account of colds.

3. The average loss of time of 568 individuals was 6+ days per six months.

4. The average loss of money was \$21+ per six months, not including individual expenditures for medical treatment, etc.

5. The total loss in six months' time was \$12,105.37 for 568 individuals.

6. In addition to this there is a loss of energy, equivalent to \$3+ per six months per person.

**Other Data.**—1. The most common cold is the "head cold."

2. Most colds occur in the month of March.

3. Individuals from thirty to forty years of age suffer most from colds. Department store employees suffer most in proportion. Half of them lose time on account of colds.

**Conclusions.**—1. Preventive methods are essential in dealing with common colds. Better working conditions, pure air, even temperature, proper ventilation and the proper amount of humidity are important factors. Nourishment, general hygiene and proper clothing are necessary precautions as in guarding against all other disease.

2. After the onset of a cold, proper diagnosis is essential to ascertain whether the cold is infectious.

3. Individuals suffering from infectious colds should be isolated.

be confessed that our treatment of the disease during the acute stages makes but little advance. Flexner and his pupils in America and a number of workers in Germany have identified and cultivated virus of the disorder, while elaborate studies made in many lands have brought to light a quantity of interesting and important facts with regard to the ways in which the infection is caught and spread. Its prophylaxis can be compassed nowadays better than was formerly the case. The patients can be isolated; their infectious nasal, buccal, and pharyngeal secretions can be appropriately dealt with; and the many healthy carriers of the disease can be rendered less harmful to others by the local use of antiseptics, such as urotropin or hexamethylene tetramine. But once the infection has been caught these antiseptics are comparatively powerless, and when it has reached the central nervous system the virus is almost inaccessible to drugs. It is true that a minute fraction of the doses of urotropin which a patient receives may reach his cerebrospinal fluid, and so may tend to inhibit the growth of the virus of infantile paralysis in the nervous system. So far as it goes this is, no doubt, an excellent thing; unfortunately, however, there is no good reason for believing that urotropin, the best antiseptic for the purpose at present known, possesses any great practical value in treating the complaint in its acute stages and cutting short its progress. This powerlessness in the face of an acute infectious disorder so dangerous and crippling as infantile paralysis is one of the reproaches of modern medicine.

A gloomy picture! But its gloom is somewhat lightened by a number of considerations very clearly set out by Mr. Robert Jones in the Annual Oration to the Medical Society of London. The matter is one of great practical importance, particularly at the present day when outbreaks of the disease seem to have grown more frequent, and at this season of the year when the warmer weather is coming, and with the increased likelihood that small epidemics of infantile paralysis will occur. Mr. Robert Jones does good service by laying down the lines on which medical treatment should be given to cases of poliomyelitis in their earliest stages, and by emphasizing the fundamental importance of beginning that treatment at the earliest moment possible. Treatment at this stage habitually falls into the hands of the medical man in attendance and not into those of the surgeon; and Mr. Jones would make it a general rule that in every case the head and spinal column should be kept at rest from the very beginning of the attack. If the child has much pain in the spine and limbs, as not rarely happens, fixation of the spine and limbs gives more relief than any other procedure. In any case, to keep the spinal cord and head at rest, so far as possible, in acute poliomyelitis is only to act in accordance with the general principles regulating the treatment of inflamed organs or areas in other parts of the body. It is important that this rest, continued through the acute and early convalescent stages, should be continued so as to prevent the adoption of faulty positions by the affected limbs, in order that the deformities



**The Early Treatment of Infantile Paralysis.**—This subject is summed up in the *British Medical Journal* (May 30, 1914), as follows:

For all our increasing knowledge about acute anterior poliomyelitis or infantile paralysis its etiology, pathology, and epidemiology, it must

that are likely to follow the paralysis may be minimized. Until the tender stage of the disease has passed away—a matter of from three to eight weeks or even more—no active treatment should be undertaken; it is argued that active myelitis may be present throughout the tender stage, so that treatment by massage or electricity would be premature.

Having drawn attention to the importance of complete rest during the early stages of infantile paralysis, Mr. Robert Jones proceeds to point out the necessity for great care when active treatment is at last begun. It is not the nervous part only of the neuromuscular apparatus that is damaged in infantile paralysis. Everybody knows that the motor nerve cells in the anterior horns of the spinal cord are injured in this disease; but it is not so generally realized that the affected muscles may suffer doubly—first in their nerve supply, and secondly by being themselves overstretched while thus disabled. Hence it is of great importance that from the first they should not be stretched, and to avoid this, attention must be given to the position of the limb; and, again, that when massage and active movements are prescribed care should be taken to avoid the possibility of straining or overstretching the injured muscles. The massage must be very gentle at first, the movements must be carefully limited, and the limb must be put up in an apparatus so as to keep the paretic muscles in a position of relaxation until they have improved in tone. The success of treatment depends upon the maintenance of this muscular relaxation continuously until there is evidence that the damaged muscles have begun to recover. When this occurs the position of relaxation may be gradually discontinued.

Mr. Jones gives a very clear and careful account of the various methods of treatment he has found effective in infantile paralysis, and he emphasizes and explains his points with a number of illustrative cases and illuminating comments upon them. We shall not attempt to follow him into the discussion of the operative measures that may be taken to remedy paralyses and deformities which remain after rest, in its special application to particular groups of muscles, and judicious massage have accomplished all that is possible by these means. They call for the exercise of the highest surgical judgment and skill, and incidentally raise problems which neurologists have not yet fully solved.

**Treatment of Puerperal Infection.**—Gillmore states that puerperal infection is not usually a local disease but is a general infection or bacteriemia. The primary focus is located in the parturient canal, endometrium, tubes, cervix, vagina or perineum, and is secondary in importance to the general infection. In the severe bacteriemic, or general infections, the streptococcus is usually responsible. The pneumococcus, a variety of streptococcus, is sometimes found. When there is a pyemia some

variety of the staphylococcus or the colon bacillus is usually the cause. This organism does not multiply in the blood stream as does the streptococcus, and is usually localized. In order to inaugurate a rational treatment in puerperal infection, it is imperative to ascertain by a blood culture the germ causing the infection. From this specimen an autogenous bacterin is made. Clinical experience demonstrates that the administration of vaccines is unsatisfactory unless there is a leukocytosis above 15,000. When the count is below this number, the administration either hypodermically or by mouth of nuclein is indicated. For the nonoperative treatment of an uncomplicated case of puerperal infection the patient should have complete rest, physical and mental, in a well-ventilated, sunny room. Drainage should be favored by the Fowler position. The hyperpyrexia should be controlled by cold sponging and an ice-bag on the head. In the case of a local pelvic inflammation, an ice-bag should be applied over the affected area. Elimination is an important factor and should be favored by both the bowels and the kidneys. The drop method of introducing normal saline solution into the rectum is desirable, as it saves the stomach, allays thirst and favors elimination by the kidneys. As it requires five days to make an autogenous vaccine, first a serum or antitoxin should be administered, followed by a reliable stock vaccine if the blood count is favorable and there is an indication that the patient lacks sufficient reaction to combat the infection. The stomach should be carefully guarded. All useless medication, whisky, quinin, etc., should be avoided, and the stomach practically reserved for nourishment only. Feed the patient carefully, at regular intervals. Discontinue breast nursing unless the mental effect is too depressing in the mother's weakened condition. Operative treatment is positively limited to absolute indication. Uterine curettage is to be recommended only for a hemorrhage, which indicates that there is a foreign body in the uterus. The uterus should be left alone in the event of the retention of the membranes. Should a pelvic abscess develop, the indications are for an extraperitoneal drainage, preferably by the vaginal route, and under gas or scopolamin and morphine as an anesthetic. Palliative measures should always be tried before a radical operation is considered. In the lying-in period, pyosalpinx demands the same procedure as would be indicated otherwise. A radical operation must not be attempted until pyosalpinx becomes chronic. This is determined by a normal temperature and a low leukocyte count. The operative procedure in acute pyosalpinx should not exceed vaginal drainage except in rare instances. In those unfortunate cases of uterine multiple abscess there is authority for considering the necessity of removing the uterus, but von Veit believes that in those cases in which the puerperal sepsis has become alarmingly general and the blood is swarming with streptococci, the removal of the uterus is decidedly a doubtful procedure. When there are few streptococci in the blood, the patient will

'Dr. R. T. Gillmore, *Jour. A. M. A.*

recover without a hysterectomy. When the streptococci are confined to the lochia, the operation is contraindicated. The writer emphasizes the necessity of resisting the temptation to give vaginal and uterine douches. The discharge, if any, should not be washed away with an antiseptic, as this inhibits the antiseptic action of the normal secretions and prevents the phagocytic action of the white blood cells on the bacteria.

**Buying Human Milk.**—Of course everyone knows that we are very far from discovering how to modify cow's milk so that it will resemble the normal food for infants, and that breast feeding is imperative for proper growth and development. When the child is deprived of its normal supply, we can do fairly well, but in a certain proportion of cases we fail. It may not be known to all physicians that such cases will generally thrive if only a little human milk is given to the child—even as little as one feeding a day but the more the better. Among primitive people an infant is usually killed if its mother dies. They probably know from experience that it will die anyhow. If the mother's milk fails, it was a custom for her to buy milk from other mothers, and this is sure to become a recognized traffic in civilization. Dr. B. R. Hoobler of New York City discussed the matter at the Section on Pediatrics of the New York Academy of Medicine, Jan. 8, 1914, and described his experiences at Bellevue Hospital. The results were as follows:

- (1) We have shown that mothers are perfectly willing to sell their milk.
- (2) That certain mothers can spare a portion of their milk without detriment to their own child.
- (3) That human milk can be purchased at a reasonable price.
- (4) That its collection can be accomplished without additional machinery than may be found in connection with any well-organized Social Service Department.
- (5) If needy mothers are chosen to furnish the milk a double charity is performed, viz., a struggling mother is helped to support herself and child, and sick babies are furnished with the best food known.

**Treatment of Pruritus Ani.**—J. Cropper (*Brit. Med. Journ.*, May 2, 1914).—Any well-marked case of pruritus ani always exhibits one or more tiny cracks or fissures of the skin round the anus, which may be intensely painful and are always very irritable and difficult to cure. From time to time the trouble is aggravated by the occurrence of one or more perianal abscesses which cause more or less trouble according to their size and depth. Pruritus ani is mainly a disease of cold climates. A dry climate is worse than a moist one, and a rich diet is a predisposing factor.

Two remedies are of real and lasting benefit. The first is tincture of iodine (*B. P.*), which may be used in half or full strength with im-

purity. It is not at all irritating to mucous membranes, and the slight pain, caused if there are open skin cracks, is quickly over. A patient who had got into a very bad state with numerous skin cracks, wash-leather appearance of the skin, and not infrequent perianal abscesses, and loss of sleep, found that, used thrice weekly, this remedy enabled him to sleep all night, and, in fact, made him comfortable. It should not be used so as to excoriate the skin. Even better than tincture of iodine is compound tincture of benzoin. Mildly styptic and really antiseptic, its action may be largely mechanical, and give the necessary rest to the affected part. Within 2 minutes or so the spirit in the tincture evaporates, and then all temptation to scratch the part is over. It is cleanly, and does not soil the linen as most ointments do. It may be used twice or thrice daily, and never irritates. Samples vary greatly in color from a light tint to a dark brown, and also in consistency; but they seem to have the same effect, though, perhaps, the darker and thicker is the most useful. It is necessary to use the balsam before a hot bath if the water is very hard, prolonged hot baths in hard water being very injurious.



**Pure Water at Home and Elsewhere.**—The Chicago Department of Health, according to the *Illinois Med. Jour.*, offers the following suggestions especially to summer resorters:

Polluted water, dirty milk, the typhoid fly and the malarial mosquito constitute an unholy quartette awaiting the arrival of our citizens at many of the summer resorts of this country.

Look out for them; be prepared to spurn their advances.

There is greater danger of typhoid infection in the country districts and at summer resorts than there is in Chicago. Ordinarily the water supply is bad, the milk supply is not subjected to inspection and flies abound.

The chief menace is polluted water. Fortunately it is the easiest to overcome.

Resorters who derive their water supply from shallow drug wells or from a body of water into which sewage is discharged, and who drink it untreated, are in imminent danger of typhoid infection. As most resorts have a water supply of this character, and as relatively few resorters take the trouble to treat the water before using it, there is little wonder that so many of our citizens return from their vacations ill with typhoid fever.

The tendency to have confidence in the purity of a water supply is far too often a misplaced confidence. It is much safer to view it with suspicion and treat it accordingly.

There are two simple methods by which water may be made safe for drinking purposes—(a)

boiling, (b) hypochlorite treatment. The purification of drinking water by hypochlorite treatment is very simple, inexpensive and highly efficient; it is a precautionary measure which should be adopted by every resorter and by every traveler whose duties carry him into "typhoid territory."

*To Purify Drinking Water.*—(Paste this in your traveling bag).—Get a few ounces of the best quality of chlorid of lime at any drug store and prepare the following stock solution: Water, 1 quart; chlorid of lime, 1 teaspoonful.

Keep this solution in a tightly stoppered bottle; a mason jar or a thermos bottle being well adapted to the purpose, the latter especially when traveling.

Label the bottle "Stock Solution"; show formula as above and add the following directions:

To purify water for drinking purposes add one teaspoonful of the stock solution to two gallons of water.

If the water is turbid strain it through fine muslin before adding any of the stock solution.

After adding stock solution allow the water prepared for drinking purposes to stand uncovered for twenty minutes before using. This allows the gases to escape and makes the water more palatable.

Then bottle the prepared water and keep on ice. Never put ice in the water.

Another source of water-borne infections, common to many resorts, is the bathing beach with its nearby sewer outfall. Be sure that the water you swim in is not fouled with human wastes.

*Milk Dangers.*—Very little of the milk supply of summer resorts is subjected to inspection and sanitary control; much of it is dirty and dangerous and should not be used until home-pasteurized.

You can eliminate the milk dangers by following these simple rules:

*To Purify Milk.*—Take a pail a little shorter than a milk bottle; place a saucer in bottom of pail and stand the bottle of milk cap on the bottle on the saucer.

Now pour hot water into the pail until one-half of the bottle is submerged, place the pail and contents on the stove and bring water to the boiling point. When water begins to boil immediately remove bottle of milk from pail and cool as rapidly as possible.

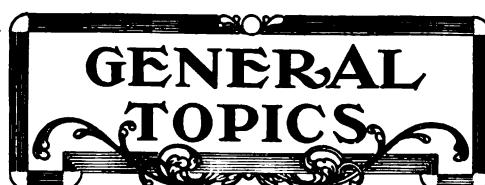
This pasteurizes the milk, kills the disease-producing germs in it.

Always keep the milk cool, in tightly covered and scrupulously clean receptacles.

Some interesting matter on this subject is assembled in the *Journal of the American Medical Association*, which points out that urticarias, erythemas and scarlatiniform eruptions may be caused by belladonna salicylic acid and arsenic or any of their salts or preparations, anti-toxin, many of the volatile oils and drugs containing them (as copaiba, santal oil, turpentine), some of the synthetic compounds (as antipyrin, sulphonal, etc.), chloral, quinine and its salts, and opium and any of its alkaloids or preparations. These eruptions appear in some patients after a single therapeutic dose of any of these drugs; in others only when the drug is pushed, or when it has been given for some time. The frequency of idiosyncrasy against these drugs follows about the order in which they are named. Arsenic will rarely cause an eruption, unless it is pushed to full physiologic action. Some patients acquire a drug tolerance and no subsequent eruptions occur after the first dose or two. This is typically true of some persons who are susceptible to quinin.

Unless the drug is being pushed to full physiologic action with a definite object or a tolerance is expected and desired or the discomfort is unimportant, the drug should be stopped, a cathartic given, and soothing, bland mucous membrane sedatives should be administered, such as bismuth subcarbonate, sodium bicarbonate, milk of magnesia or slippery elm or flaxseed infusions. Even milk and starch-water are sometimes very efficient sedatives to the mucous membrane of the stomach and upper intestine if it has been irritated by a drug. Of course, it is possible that the drug has caused anaphylaxis and the irritant is already in the blood. Then the treatment consists of large amounts of water, a bland diet, alkalies such as potassium citrate, large doses of sodium bicarbonate, and perhaps calcium in some form.

Bromides and iodides frequently cause skin eruptions, occasionally after the first dose, but generally after a series of doses. An eruption quite generally occurs if these drugs are at all continuously given. Some patients, like epileptics or syphilites, who are given large doses of bromides and iodides for a long time, become tolerant and do not have the skin eruptions, unless the dosage is very large. The iodide eruption is likely to be papular but is rarely pustular. The bromide eruption is papular and frequently pustular and the bromides may cause serious skin eruptions. It is sometimes thought that when arsenic is given coincidently with bromides this troublesome eruption is less likely to occur. It also should be remembered that if sodium chloride is removed from or greatly reduced in the diet of the patient, such large amounts of bromides as were once given are unnecessary. Therefore, the eruption is less likely to occur. The iodides cause eruption less often than the bromides. The eruption from either drug rarely causes itching, but it takes some time for the eruption to disappear, even when the drugs have been discontinued.



**Drugs Which Cause Eruptions.**—Various eruptions may be caused by the use of drugs.

## Defective Elimination

readily becomes a chronic condition since the toxemic patient lacks that initiative which is necessary to active physical exercise; thus *cause* and *effect* form a circle which must be broken by rational therapeutic treatment while proper hygienic conditions are being re-established.

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performs a *double service* by stimulating to normal function and by disinfecting the intestinal and urinary tracts.

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**PUBLISHED BY  
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**PUBLICATION OFFICES:  
189 COLLEGE STREET, BURLINGTON, VT.**

**NEW YORK OFFICES:**

**18 East 41st St., New York City.**

**H. EDWIN LEWIS, M. D.....Managing Editor  
WM. T. HANSON.....Business Manager**

**Subscription Price, One Dollar a Year in Advance.  
Single Copies, 15 Cents.**

**POSTAGE** in the United States, Mexico, Hawaii, Guam, Porto Rico and the Philippines, free; foreign postage, 50 cents. Subscriptions may begin at any time. Volumes end with the last issue of December.

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## MEDICAL PROGRESS.

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### Pruritus Vulvae.

Pruritus vulvae is an itching or irritation just within the vulval orifice or in the perivulval skin. The pathology of this condition is not well defined, but it is generally believed to be a hypersensitive condition of the nerve endings in the dermal structures, which renders them particularly susceptible to irritating influences. This itching of the vulva is one of the most common and at the same time most distressing diseases that afflict womankind. In some cases the itching is periodic, being manifested only at certain times, as for instance, during or following menstruation, or during pregnancy; in other cases, the itching is very persistent, giving rise to an almost irresistible impulse to rub or scratch the parts and causing such intense suffering that the patient may be unable to sleep. These extreme cases are very apt to affect the general health and sooner or later cause very marked loss of flesh and vitality. Pruritus vulvae is very frequently secondary to some discharge from the vagina, or to some constitutional disorder as gout, rheumatism, diabetes, syphilis or tuberculosis, which produces marked changes in the local structures. These changes in turn may induce a protracted catarrhal inflammation, or leucorrhea, ulcerations of the cervix, or some chronic vaginal disease which, through an inevitable discharge of mucus or pus, will cause a more or less constant moisture of the surrounding skin and thus excite the almost intolerable itching characteristic of the disease. Pruritus vulvae may also be associated with disturbances of the digestive tract from improper feeding, for it has been found that the circulation in the blood of certain poisons resulting from intestinal putrefaction may render the nerve endings particularly sensitive and susceptible to local irritation. The suffering which patients thus afflicted undergo is often pitiful in the extreme, especially since the private nature of the affection many times keeps them from seeking prompt and appropriate treatment. Aside from the effect of these aggravated forms of pruritus on the general health, it is evident that involuntary or uncontrollable efforts to obtain relief by scratching or rubbing are extremely apt to produce abrasions and raw areas that may become infected and lead to very serious infections.

Treatment should be instituted at once and followed with the utmost care and thoroughness.

It will be apparent that measures for relief divide themselves into two parts: first, general; second, local.

General treatment naturally comprehends removal so far as possible of all predisposing causes, such as gout, rheumatism, diabetes, syphilis, etc., likewise the correction of any digestive disturbances. Where the patient's general health is below par, tonics and suitable measures of a reconstructive character should be employed.

Local treatment consists essentially in the correction of any vaginal disorders, the careful removal of all irritating discharges and the establishment of the most fastidious cleanliness. Ulcers of the cervix should receive appropriate treatment and the most painstaking efforts directed toward the removal of any abnormal conditions. The medical attendant will usually find it necessary to advise frequent douching, and the frequency, quantity and character of these douches will be defined by the special needs of each individual patient. In addition to measures for removing discharges and assuring cleanliness, local applications will always be necessary to allay and overcome the severe itching. Of the many different local remedies that have been suggested there is none that will be found so promptly effective and so satisfactory from every standpoint as K-Y Lubricating Jelly. As a matter of fact, the relief that is obtained when K-Y is liberally applied to an itching area is often little less than astonishing. It seems to have some unique, soothing, sedative and cooling effect on the skin and the nerve endings that enables it to allay the most severe itching. Moreover, it is not merely temporary in its effect, for, unlike many other remedies, it does not lose its efficacy on continued use. It quickly reduces congestion and then seems to impart some tonic influence to the sensitive tissues which makes them less susceptible to local irritation. Where the parts have been made sore and raw from scratching, K-Y Lubricating Jelly acts as a prompt healing agent, after it has effectively overcome all smarting and burning. The medical attendant will find, therefore, that K-Y Lubricating Jelly is the most useful and efficient emollient that he can recommend for these cases of pruritus vulvae. Not only does it deserve constant use because of its marked antipruritic properties, but it has the further advantages of being non-greasy, colorless, and water-soluble. *It never stains, discolors or soils the bed-clothing, dressings or wearing apparel.* Consequently, it is the most cleanly and pleasant local application that can be used for the class of cases under discussion. The more it is used, the more useful it becomes and it is no exaggeration to state that it is the most dependable and useful anti-pruritic emollient and soothing local agent at the command of the profession.

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### Pluto Water in Treatment of Dyspepsia.

Pluto water has always proven satisfactory in the treatment of the various forms of dyspepsia, chronic intestinal stasis and obstinate gastrointestinal disturbances, for they promptly respond to a therapeutic regimen which includes the daily use of this native mineral water. The evidence of a large number of physicians conclusively proves that it is well tolerated by the stomach, causes no griping or intestinal irritation, is uniformly dependable in action and gratifying in results. Samples, clinical data, analysis and literature interestingly descriptive of the hygienic methods employed in bottling Pluto, will be promptly forwarded on application to The French Lick Springs Hotel Co., French Lick, Indiana.

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# NEGLECT OF MENSTRUAL DISORDERS NECESSITATES MANY A SURGICAL OPERATION

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## GENITONE

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Genitone is composed of Viburnum Prunifolium, Hydrastis, Pulsatilla, Passiflora and Senecio.

Abundent clinical experience has established its value in the functional disorders peculiar to women :

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2 In the course of pregnancy; hemorrhage, retro-deviation, syncopal attacks, threaten abortion, miscarriage, premature labor.

3 During labor; perineal and cervical dilatation, hemorrhage, and as an oxytoxic.

4 During the puerperal state; subinvolution, hemorrhage, and as a tonic restorative.

5 Incident to the menopause; hemorrhage, hysteria, headache.

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As the full value of Genitone can hardly be demonstrated by a small quantity, we will send prepaid to any physician who has never prescribed it one only full size bottle on receipt of 50 cents to cover the delivery and packing expense. The price of pint bottles is \$1.00. Genitone is carried in stock by leading druggists everywhere.

### When Authority Falters.

The voice of so-called "Authority" has repeatedly spoken in the course of this World's existence, against Progress and in favor of a Fallacy.

It was so-called "Authority" that was responsible for the Inquisition as well as the Reformation.

Servetus defied it and suffered for his temerity. Columbus fought against it and finally won out—but at cost to himself.

It required many centuries to overthrow the fallacies that Galen—one great authority in medicine—taught.

The World of to-day—spiritual, mundane, or scientific—is becoming more matter-of-fact; it has to be shown: this is particularly true of medicine—and therapeutics.

"Authority," no matter how mighty or actively promulgated, cannot perpetuate a Fallacy or assassinate a Truth.

It cannot for example ensure the use of that which is theoretically valuable but practically useless, any more than it can bar any agent that, when properly used, secures results.

So much at least can be set down upon the credit side of Progress.

For instance, it is no longer held that even the most skillful experimenter can reproduce in the test tube these physiological processes that form the cycle of metabolism, respiration, circulation—and Digestion.

It is admitted that such particularly important physiological agents, as enzymes, while they may be recovered in a more or less active state cannot be judged altogether by their action when viewed in the laboratory *in vitro* experiment—where only one factor, i. e., temperature, of the many factors necessary for their action, can be successfully maintained.

So-called "Authority" has preached for example that Pepsin and Pancreatin are incompatible, that when placed in the same compound they are mutually destructive, and that consequently their therapeutic employment in such form is illogical and useless.

This in spite of clinical evidence to the contrary. Such so-called authority pays no heed to clinical evidence.

Hence it is founded upon what is termed "left-handed logic."

The most important element in making any test which is based upon physiological action is *Proper Technique*.

Hence, by the employment of proper technique it is possible and practical to show by *in vitro* experiment that such a compound containing pepsin and pancreatin, as has for years been prescribed by thousands of physicians under the name of Lactopeptine, and exerts peptic action upon protein as well as tryptic activity upon protein, amylolytic action upon carbohydrate and lipolytic action upon fat!

Another confirmation of the fact that the empiricism of yesterday or to-day may become the scientific fact of the future.

Fallacies like weeds are hard to kill and difficult to stamp out.

Authority based upon false theory or "left-handed logic" is difficult to overthrow.

But as has been eloquently declared the "Truth is mighty and will prevail."

He who has in the past prescribed Lactopeptine, because he got results, may find herein his vindication. He who has hesitated to try Lactopeptine, out of deference to so-called Authority, may find herein justification for making such a test.

Lactopeptine has been prescribed by physicians for over forty years.

There is every reason to believe that it will continue to be prescribed so long as digestive disturbance, derangement or disorder causes the doctor to seek an efficient remedy therefor.

### No Advantage Taken by Knoll & Co. of Present Conditions.

We understand that the well known drug concern of Knoll & Co., have not increased the price of any of their products. In other words, this firm will continue to market their specialties as long as the present supply lasts at the same prices in effect when war was declared. When the supplies on hand are exhausted, the prices on any new consignments will be no higher than are actually required by the exigencies of the situation then existing.

In order to aid in meeting the large and constantly growing demand for their various products in the United States Knoll & Co., have taken steps to manufacture as many of these in this country as conditions will permit. It is not known how long this will be necessary, but the patrons of this company may be sure that their interests will be safeguarded in every respect. American physicians, therefore, may go on using such well known remedies as Digipuratum, Diuretin, Bromural, and so on, secure in the knowledge that Knoll & Co., will neglect nothing that will help to maintain the friendly relations they have so long enjoyed with their patrons.

### A Valuable Local Application.

At this season of the year when sudden and extreme changes are so apt to lead to nose and throat colds, patients should be warned of the necessity of giving the nasal mucous membrane more than ordinary care. A protecting oil, possessing antiseptic properties is especially desirable and Sabolol Spray seems to meet these requirements most satisfactorily. This exceedingly effective local application coats the nasal surfaces, promptly allaying irritation and immediately controlling the growth and activities of any bacteria present. Briefly, Sabolol Spray has a large field of utility, and its extensive use by the physicians of the country speaks in no uncertain way of the estimate placed on its therapeutic efficiency.

# Feeding In Typhoid

The seat of the lesions of typhoid fever is also the seat of the organs which select, digest and assimilate food.

The inflamed intestinal tract, with its swollen glands and accompanying perversion of function, is in condition to do but little more than fight the bacterial invasion which is the prime cause of the trouble.

Digestive and assimilative processes have become weakened, as a natural consequence of the inflammatory state of the intestinal mucous membrane; body waste is taking the place of equal and compensatory replenishment of cells—emaciation naturally following.

Yet the host—the patient—must be kept alive, if possible, until the conflict is past, and his forces are reestablished. It is here that food—easily digestible, nutritious, unirrigating food—is of such insistent importance. It is here that many discriminating physicians have found

# Grape-Nuts

to be a delicious and most efficacious, convenient, and specially adapted food (with cream or milk, hot or cold, as directed by the doctor) in the adjunct, or dietetic treatment of typhoid fever.

## “There’s a Reason”

The Clinical Record, for the Physician’s bedside use, together with samples of Grape Nuts, Instant Postum and Post Toasties for personal and clinical examination, will be sent on request to any Physician who has not yet received them.

### Recovery from Bone Tuberculosis.

The following interesting case records the experience of a well known physician with the so-called "intensive iodine treatment":

The patient was a young man of 22 years of age. Mother and one sister had died of pulmonary tuberculosis. Two years ago first noted tender spot on right shoulder opposite about the third dorsal vertebra over the scapula. Gradually this became more and more painful, an abscess finally developing and breaking open five or six months after first appearance of soreness. This abscess discharged freely for some time but under thorough antiseptic treatment showed substantial improvement. In spite of every effort, however, it was impossible to heal the sinus that persisted. From time to time small spiculae of bone were discharged, and gentle probing plainly indicated that a considerable portion of the scapula was involved. A diagnosis of tuberculous osteitis was made and operation advised. This was done, in due course, the sinus being laid open, all diseased tissue cut away, and the affected part of the bone curetted with painstaking thoroughness. Some improvement followed, but still the wound refused to heal. Another sinus developed which discharged more or less continuously. Repeated microscopic examinations of the discharge were made but none showed tubercle bacilli until six or seven months ago. In March of the present year the intensive iodine treatment was begun with the use of Burnham's Soluble Iodine. The patient was given 10 drops in a glass of water three times a day and after five days the dose was increased a drop each day, i. e., 11 drops three times, next day 12 drops three times, next 13, and so on, until he was taking 48 drops three times a day. At this point the patient showed slight symptoms of "iodism" and the dose was reduced to 20 drops three times a day, and after a few days gradually increased as before. In addition to the use of Burnham's Soluble Iodine internally as above, the sinus was washed out each day with saline solution, after which a solution of Burnham's Soluble Iodine—a tea-spoonful to a scant glass of warm water—was injected as deeply as possible.

After about two weeks the gain in the patient's condition became very noticeable; the discharge was markedly decreased and the sinus showed evidence of healing at the bottom. Recovery from this point was progressive and two months and four days after beginning treatment the wound was closed perfectly and the patient had gained six pounds in weight.

Needless to say ample quantities of good food and fresh air were insisted on throughout, and nothing was neglected that could contribute in any way to the patient's recovery.

The influence of Burnham's Soluble Iodine was so marked, however, and the result obtained was so decisive that there can be no doubt that credit for such a happy outcome is mainly due to this dependable iodine preparation. Its solubility and rapid and complete absorption without toxic effect unquestionably allowed the introduction of a pure iodine in sufficient quantities and for a sufficient period

to assure counteraction of the bacterial toxins, a stimulation of bodily nutrition, and a general augmentation of the processes of repair.

### Rubber Heels and the Prevention of Diseases.

To-day, in his efforts to prevent disease, the paramount purpose of the physician is to avoid every danger or evil that tends to lower vitality and increase susceptibility. Appreciating the harm that essentially results from the continual impact of walking with ordinary leather heels on hard, unyielding floors and sidewalks, no argument was needed to convince the keen, painstaking physician of the unique value of heels of new live rubber. He saw at once their capacity for reducing the jar and shock to the spinal structures and quickly realized their prophylactic importance. Their influence in decreasing fatigue was especially appealing and it is a striking testimonial to the way the medical profession feel toward rubber heels that over 75 per cent, of all practising physicians wear them. It is hardly necessary to point out the superiority of O'Sullivan's heels of new live rubber. Supplied in all sizes to fit every kind of heel, they should be used by all, from the youngest to the oldest. Their hygienic value has been long established and they fill an important place in the modern scheme of personal hygiene.

The O'Sullivan Rubber Co., have issued recently a very valuable and interesting little book on "Rubber Heels from the Medical Viewpoint." It will be sent gratis to any physician on request. Address O'Sullivan Rubber Co., 131 Hudson St., New York.

### Ergoapiol (Smith).

Ergoapiol (Smith) is a utero-ovarian anodyne and stimulant, surpassing ordinary agents of its class, in that its antispasmodic and tone-imparting action on the uterus and its appendages is much more prompt, prolonged and agreeable. The preparation is of established value in instances where the menstrual flow is irregular, profuse, deficient or attended with pain in consequence of diminished vitality of the sexual system, climatic influence or morbid processes. In the treatment of the various forms of dysmenorrhea—particularly the congestive, membranous and neuralgic types—Ergoapiol (Smith) is decidedly preferable to such analgesics as the coal tar or opium derivatives, because it relieves pain and increases the contractile power of the uterus without exposing the patient to the dangers of a drug addiction. Ergoapiol (Smith) is of distinct service in the treatment of those psychic disturbances which frequently attend the physiologic cessation of menstruation, or the menopause. Dosage.—In amenorrhea, dysmenorrhea, menorrhagia and other menstrual disorders, one to two capsules should be administered three or four times a day. An original package of Ergoapiol (Smith) will be sent, on request, to any physician who is unfamiliar with the preparation. Martin H. Smith Company, New York, U. S. A.

# American Medicine

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EDITED BY

and

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PUBLISHED MONTHLY BY THE AMERICAN MEDICAL PUBLISHING COMPANY.

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Complete Series, Vol. XX, No. 10.  
New Series, Vol. IX, No. 10.

OCTOBER, 1914.

\$1.00

YEARLY  
in advance.

**Our Belgian confreres** are undergoing trials that no language can even approximately describe. In a few months they have seen their country transformed from a land of peaceful pursuits and prosperous homes into one of chaos and bereavement. In all history there is no record of a country as happy, contented and successful as Belgium was, suffering such complete annihilation for no other reason than its unfortunate geographical location. Opinions as to the cause of the present war may differ greatly; views in regard to the way in which it is being prosecuted may be widely divergent; but there are few honest conscientious men who will not agree that the world has seen few sadder spectacles than the devastation of Belgium. Yesterday it was a nation enjoying the fruits of its people's industry; a country proud of its cities, its beautiful buildings, its art treasures and all that went to make it a land of thrift, culture and social progress; a country of charm and delight for the traveller. But to-day, alas to-day, Belgium is no longer a smiling land. Ah, no, where peace and comfort dwelt, there are now only anguish and fear. Where happy homes nestled on the country side and with their orchards, well tilled gardens and fields of flowing grain told the story of thrift and contentment, to-day there are only tumbled walls, ghost-like chimneys and trampled acres to tell of the blight of war

and the desolation it brings. And the people, yesterday happy, industrious and well-to-do, proud of their homes, their families and their country—to-day broken outcasts, their homes in ruins, their occupations gone, and their one great desire—like hunted things—to hide, to get away from the horrors that overwhelm them. Civilization for them has crumpled up and fallen to pieces; their world has come to an end, and from men, women and children living the lives of modern civilized people, they have become panic-stricken individuals, hungry, cold and dumb with the terror that has overtaken them. Surely if any people have known the acme of misery it is the Belgians. The sights they have seen, the things they have suffered, the calamities they have undergone have stunned them; they do not know which way to turn. Helpless, forlorn and sick with their sorrows, starvation and cold are all that confront these hopeless people unless the neutral nations of the world give bountifully—and quickly. The movement already underway looking toward immediate relief for this stricken nation is the one bright spot in the situation.

**The medical men of Belgium** have suffered no less severely than the rest of their countrymen. The holocaust that has swept over their land has left no class exempt

and like all others the physicians are also destitute with their homes, equipment, libraries, everything destroyed and lost. No, not everything, for medical men constitute one class that never loses—the opportunity to work. The greater the calamity or catastrophe that comes to a community the greater need there always is for the services of its doctors. So, although stripped of their belongings and no less sorrow laden than their fellow-sufferers, the physicians of Belgium, true to the splendid traditions of their calling, have gone on doing their best to relieve the physical distress and suffering that surround them. But though they have had work in plenty, their incomes have vanished. What possible recompense can be expected from a people who are destitute and starving—other than words of appreciation and gratitude? With the trade, commerce and finances of the country practically wiped out, with the social order completely upset and the people penniless and ruined, the doctors can look for nothing but a share in the common woe. Indeed the lot of the physicians of Belgium bids fair to be harder even than that of the laity, for while they are working for the afflicted, their own wants are sure to receive little attention. At any rate, the hunger and cold that confront the great mass of the people also confront the doctors. Many have families dependent on them, so their anxiety and anguish as well as their physical distress can easily be imagined.

The plight, therefore, of the physicians of Belgium is terrible indeed. Unless steps are taken at once to relieve their condition, a few short weeks are certain to witness scenes of suffering among our Belgian colleagues that will beggar description.

It has been suggested to us from several sources that AMERICAN MEDICINE should

undertake the collection of a fund for the physicians of this stricken country. We have been very loath to make any move of this character for fear our purpose would be misinterpreted and misunderstood. But it seems almost necessary that something should be done in this direction, if for no other reason than to draw attention to a class of men who are apt to be overlooked because of their activity for others. Therefore, hopeful that no one will place a wrong interpretation on the movement or be so unkind as to think it possible for this or any other journal to seek any publicity from a condition so poignant with human misery, we have yielded to the requests of many interested friends and will undertake the collection of an American Fund for Belgian Physicians.

**This Fund for Belgian Physicians** will accept contributions not only from American medical men, but from every one who realizes the great and urgent need of the doctors of poor bleeding Belgium. A committee composed of prominent American physicians is being organized, and this committee—the personnel of which will be announced in our next issue—will have charge of the entire movement; all contributions will be turned over to them as received. A list of contributors will be published in forthcoming issues, and the progress of the Fund recorded in detail.

To every physician in America we, of course, make an especial plea for a small contribution to this Fund. No matter how small the amount, it will be welcome and help to swell the total. We realize only too well the many demands that we American physicians have to meet in our every day life. Collections with every one of us in general practice are exceedingly slow. Few indeed are the dollars that do

not have their work laid out for them long before they are collected. But there is hardly a physician in this great land of ours that cannot contribute fifty cents or a dollar to this fund for Belgian doctors—and never feel it. We ought to be willing to make such contributions not only to show our sympathy for our sorely afflicted brethren, but as tokens of our gratitude that our own land has been spared the ravages of war. Can our hearts fail to throb with joy that we are not forced to see our loved ones driven from their homes as wanderers on the face of the earth? Is there one of us who will not wish to make a modest contribution for the doctors of Belgium and their dependents, in order to show how grateful we feel that those we hold dear are safely and warmly housed in their own homes with plenty to eat and plenty to wear instead of being homeless, hunted and hungry?

We hope every one who reads these words will send in at once—to-day—some small sum—twenty-five cents will be gratefully received. Remember "he gives twice who gives quickly," and the need of those who are to be aided by these contributions is very great. Already the suffering of some of our Belgian brethren and their families is appalling. We must relieve them just as soon as possible—or thousands of lives will be sacrificed.

We have tried to preserve strict neutrality in all that we have said in the foregoing. We are not concerned with the causes of the calamity which has come to our Belgian confreres. To use a well known remark of a great American "it is not a theory but a condition that confronts us"—the condition of men who, working like ourselves, with problems similar in every way, suddenly through no fault of their own, have had their all taken from them. Famine, cold and

misery are all they can expect—with the added anguish of having to witness the suffering of their loved ones—unless those in happier circumstances help them—not next week, not to-morrow, but now, to-day. Let every one, therefore, who intends to give something send it in early, be it ever so humble. Every dime will help, if only to give a bowl of hot nourishing soup to some one; it may be to some doctor's little girl, to his aged mother, or even to himself, its warmth and stimulation enabling him to go on with his work for those who need his services. It is the far reaching influence every dollar given to a needy person may possibly have on that individual—and through him on countless others—that makes even the smallest contribution rich in possibilities.

With these words we leave the whole matter to our readers, confident that this appeal for the physicians of Belgium will not fail of a generous response. All contributions should be addressed to the Fund for Belgian Physicians, care AMERICAN MEDICINE, 18 East 41st St., New York City. Make checks payable Belgian Medical Committee. In sending in contributions please give name and address of donor. This will not be published if not desired, but it will aid the committee to keep accurate records. This committee will work with the Belgian Relief Committee and doubtless arrange with that body to make disposition of the funds collected. In our November issue there will appear a full report giving a list of all contributions, the names of the committee in charge, and detailed information in regard to disposal of funds, etc.

In the meantime, may no time be lost in creating a fund that will bring a ray of comfort and cheer to our sorely afflicted Belgian colleagues.

**Urinary changes in malignant disease** are being investigated and put to diagnostic use. A few years ago Salomon and Saxl of Vienna claimed to get a positive reaction in over 90 per cent by oxidizing the neutral sulphur of the urine with hydrogen peroxide, in a rather complicated chemical technique. Dr. Chas. H. Walker, of the New York Post Graduate Hospital in collaboration with Dr. Frederick Klein, a well known chemist, publish other tests which they consider reliable indications of the existence of malignant disease. They use a small quantity of iodine solution, which in the normal urine is converted into a colorless hydro-iodic acid by the addition of hydrochloric acid, but remains free in the urine of malignant disease, the color deepening with the progress of the affection. Unless other pathologic states will cause a similar phenomenon, we seem to have a valuable aid to diagnosis, but whether it will give information in the earliest stages, when the question of diagnosis is vital, remains to be seen. We are at least progressing towards the point where there will be little excuse for overlooking incipient cancer.

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**Imported beer** has long had such a reputation for superiority that some consumers seem willing to pay high prices for it, though many merely pay for the word imported on the label. The cessation of trade between Germany and America has opened the eyes of these people to the fact that American made products are just as good if not better. We hold no brief for the brewers; indeed we are much of the opinion that they are prosperous enough already. If there were less beer made of the inferior grades, there might be a more rapid decline of drunkenness than there has been in the

past. Nevertheless the undoubted benefit of the proper use of beers has placed them in the class of articles which physicians must occasionally prescribe, and it certainly behooves us to know the best. We must resist the unpatriotic tendency found throughout the nation to derogate home products. Probably our foreign born citizens are responsible for keeping up the delusion that a foreign label is a certificate of good quality. There is no beer made anywhere in the world that cannot be made here. Indeed it is absurd to say that imported workmen using the same methods and materials cannot do as well in America as abroad. Yet many a sick man has been put to unnecessary expense to get an imported beer, when the domestic would have done just as well if not better. It is high time that this thing was stopped and the worthy, high class products of the country encouraged rather than tabooed. The word "imported" has been a fetich long enough, especially in this matter of food beverages, for it has been sadly abused. There is no good reason why "American made products" should not equal those made in other countries. It only remains for the American people, particularly our foreign born citizens, to realize this, to add wonderfully to the prosperity of this country that offers such matchless opportunities for us all.

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**The exclusion of poisonous drugs from the parcel post** is working a great hardship upon the sick, and if we do not take care, the anti-drug crusade is liable to do more harm than good. We always go to extremes in our reforms and that very fact often causes a reaction which sets us back. We are now more than ashamed of the phthisiophobia we created in our anti-tuber-

culosis crusade. The good we have done was no doubt very great, but we have imposed an enormous amount of needless suffering upon consumptives. They are harmless to an adult for we are all tubercular already and yet they are shunned like ancient lepers. We always lose our sense of proportion, when we first learn of remediable evils. The number of victims of cocaine and morphine is certainly large, but it ceases to be appalling when we realize what a small percentage of the population is afflicted—a percentage which invariably resorts to some stimulant. If we prohibit one drug they will get another, and in the meantime we are injuring the sick by making it difficult for them to obtain relief regularly prescribed by a physician. It seems that a court has decided that the new law excluding poisons from the parcels post, applies equally to physicians and druggists. This rigid ruling will prevent the scoundrels in our profession from using the mails to distribute the drugs for improper uses and will thus prevent a certain amount of evil, but we already hear bitter complaints of the difficulty of getting medicines to sick men along rural delivery routes. Better trust the profession to do right even if a few of us do wrong. No law ever prevented all of any one evil and never will, nor can we prevent law breaking. The Post Office Department and the courts seem to need a definition of a poison, and we have none to offer. A substance like table salt, harmless in small amounts, is fatal in large, but to exclude it would not be common sense. A broad view of the law would seem to indicate that medicines as prescribed are not poisons in the evident meaning of the law.

**The cause of drug habits** ought to be investigated and then we might do more

good by removing it. We are probably safe in saying that we have prevented an enormous amount of drunkenness by removing the causes of the nervous exhaustion which creates the demand for stimulation. We did far less good in the old days when we looked on it as a moral fault having no physical basis. The old idea that prohibition would cure and prevent has about been given up. If a large number of a prohibition community want liquor, they will get it in spite of the few who are charged with enforcing the law. The present anti-drug law which of course meets the approval of all philanthropists, can not be expected to cure the craving for narcotics, but may shunt the sufferers to less dangerous remedies. It is a pity also that the well meaning crusaders devote so much time to saving a few drunkards, who as a rule are not worth saving anyhow, and pay no attention to the scores of thousands of infants slaughtered every year by preventable infections. A law preventing interstate travel of persons with certain communicable diseases, would save a thousand times more lives than the law prohibiting transportation of poisons in the mails.

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**American spas** ought to be developed now that the European resorts are not available. We are credibly informed that we possess every kind of water which has made the European places so wealthy and popular. But we neglect our own resources under the delusion that foreign things are better than the home-made, and some people feel that the more inaccessible and expensive a place the better it must be. The medical profession can do a great deal towards making local resorts more useful, and the profession residing at or near these places can

do much without the suspicion of commercialism or quackery. What is needed is a clear cut statement of the effects of the waters so that the profession as a whole can determine what cases to send to the resorts. It is a serious reflection on us that so many thousands or even millions of patients have spent small fortunes in trips abroad when they could have had the same things near home for a fraction of the cost. Of course we cannot duplicate the mental and nervous effect of a vacation in Europe—and that seems to be the only benefit many patients receive, but Europeans get relief at their own resorts and we should at ours. Change of scene and travel are just as beneficial here as in Europe. The greatest need is to make our resorts available for people of moderate means and the poor, but that requires endowments which can only come with time. To aid in bringing this to pass, let us neglect no opportunity of spreading broadcast the fact that our American spas and waters are not only equal to any in the world, but that many of them stand alone in more than one important respect.

**The destruction of fly larvae in manure** has been investigated by the entomologists of the Agricultural Department, who report (*Bulletin 118*) that of all the substances tried, borax was the most effective, economical and practical when used in the proportion of 0.62 pound to 10 cubic feet or 8 bushels of manure. It is applied to the fresh manure with a fine sieve or flour sifter, particularly around the edges, and two or three gallons of water sprinkled on. Garbage is treated the same way. It is said to kill both eggs and larvae. Borax should also be sprinkled in crevices in the floors of

barns and markets. In these amounts borax does not injure the fertilizing power of manure, indeed it increases the water soluble nitrogen, ammonia and alkalinity. Nor does it permanently affect the bacteria, though larger quantities injure the growth of plants. These are important matters for the consideration of city health authorities. Flies are entirely too numerous in all cities and as practically all come from stable manure it is high time to attack the nuisance at its source. Stablemen must be compelled to change their habits. It is not enough to keep manure in fly proof receptacles and remove it frequently. The breeding of flies in cracks and crevices must be stopped. There is no possibility of removing the stables, so we must make them harmless. A crusade in this direction is sure to bear good fruit.

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**The abandonment of the Department of Health Bill** by the administration has recently been announced from Washington, much to the sorrow of not a few of the medical profession. It is hinted that the high efficiency of the Marine Hospital and Public Health Service may have convinced the President that a Department of Health is not now necessary—at least not urgently so. This organization has developed remarkable skill in handling epidemics of yellow fever, plague and typhoid, and the country can rest assured that any emergency will be met properly and promptly. The high professional ability of the personnel is of itself a national health asset, and the scientific literature they have published has doubtless led many physicians to think that a Department of Health is no longer needed. The movement started when this service was confining its labors to hospital

management, but it became the "handy man" of each administration, ready and willing to perform any duty demanded of it. It has given satisfaction, and the opinion grows that it will be equally satisfactory if charged with such work as would naturally fall to a National Health Department. To its credit is the discovery of the manner in which typhus fever is transmitted, as well as the mountain fever of Montana.

Its activities in many other sanitary lines, such as child saving, show that it has long been changing into a national health organization without our being aware of the fact. If the Bill is permanently dropped, there will be far less cause for regret than twenty years ago or even ten. Perhaps, indeed it would be better dropped since a Department would inevitably become something of a political machine, and it would absorb much of the Public Health personnel to work under a new name. The danger of suppression of revolutionary ideas by officious officialism too stupid or senile to understand them, would probably be lessened, though to be sure this has always been the curse of medicine as well as every other science except on the commercial side. "Authorities" can not realize that they cease to be leaders in time, and in their latter days they almost invariably oppose new things which always appear untrue to them. Compulsory retirement on a pension at 60 would cure that.

York has been resented by a few otherwise excellent citizens in a small town, and they have urged the school trustees to defy the law like burglars do. They have been aided and abetted by a judge who has concluded that the matter was discretionary with the board and has urged it to revoke its order! When a judge can come to such a remarkable conclusion in spite of the plain intent and wording of the law, it is high time to investigate the psychology of decisions from the bench in general and this one in particular. We have long been hearing bitter criticisms of the scandalous delays and miscarriages of justice in American courts. The judges have been so strongly criticized that there is a strong movement for their recall when they show lack of judicial temperament. Judge Taft has been the foremost critic of our disgraceful legal system, but he is vehemently opposed to recall, yet when a judge in his private capacity ranges himself against the health and lives of the people, something must be done. The fault may really be with those judges who grant delays, appeals and retrials on the flimsiest kind of technicalities which are ignored in other civilized lands. Perhaps we ourselves are to blame by voting for men who are nominated because they are good politicians.

The partisan instinct makes them unconsciously favor good politics when they believe they are acting in accordance with the law and facts. Now that we have one judge working against the only known way of ending our endemic of small-pox, we wonder how many more there may be, and what chance the people have if the case is taken into court. We are quite sure that this one will receive the indignant condemnation of the great majority of intelligent people. The episode, by the way, shows

An anti-vaccination judge has been making himself noted or notorious according to one's view of the matter. It seems that the recent law making vaccination compulsory in the schools of New

the wisdom of having state laws which can overrule local prejudices, and prevent one community endangering all the rest. Local health officers often are checked by local ignorance but are aided greatly if they can show that they are obeying a higher law.

ever he gets a massive dose from contact with a case with open lesions. To be safe, such a man must live an isolated life. To enjoy the advantages of social life safely, one must be tubercular.

**The future antituberculosis crusade** is foreshadowed in an able paper by Maurice Fishberg (*N. Y. Med. Jour.*, Sept. 19, 1914). His conclusions are quoted in another column of this journal. He shows that infants are born free of the infection, but have no immunity. If they receive massive doses, they are liable to die of acute disseminated tuberculosis. Prophylaxis is merely a matter of keeping them from contact with those having open lesions. In later childhood immunity is quickly acquired from the auto-vaccination of lesions following small doses of the ubiquitous non-virulent bacilli. These bacilli remain with us through life and are able to keep us constantly immunized against massive doses. Phthisis results only when we lose this acquired immunity through some intercurrent infection like typhoid, pneumonia, measles, whooping cough or when there is a profound change in the body one to bad nutrition, alcoholism and other bad habits, puberty, and the thousand and one adversities of poverty or a bad environment. Prevention of phthisis resolves itself into the removal of all the causes of ill health so that every individual in the community can retain his immunity. Prevention of tuberculosis is impossible in communities though it is possible with rural people who never meet the infected. Freedom from tuberculosis is undesirable because the person does not acquire immunity and will succumb to the acute form when-

**Is the consumptive dangerous?** Dr. S. Adolphus Knopf, says, "We all know the danger of the tuberculous individual to a community, small or large, when he behaves as if he were not tuberculous," (*N. Y. Med. Rec.*, Oct. 10, 1914) and he ascribes the freedom from tuberculosis of sanatorium attendants, primarily to the prevention of infection. This has been the orthodox view ever since Koch discovered the bacillus, but the new facts marshalled by Fishberg and a host of other investigators seem destined to reverse matters. The consumptive is dangerous outside of communities, and to people who have never been immunized by mild infections. Of course he is fatal to infants with whom he comes in contact, but there is no evidence that he harms infants in the next block, or next house, and there is said to be no evidence that he ever re-infects an adult in the city. All writers seem agreed that there is no ground for phthisiophobia—or fear of the consumptive. Fear of consumption is a good thing if it will lead people to live properly to prevent their own latent lesions from becoming active. Knopf credits the reduction of the tuberculosis death rate in New York City to the crusade against the spread of infection, but no adults were infected either before or after the crusade, and an identical decline is reported from places where there has been no antituberculosis movement at all. According to the new ideas on the subject the reduction is one to the prevention of other infections such as typhoid fever and to the popularization of

outdoor life and hygienic living. We are glad to see that Knopf makes no mention of sunshine as a preventive or cure, and has abandoned his dangerous sun baths. We hope now he will let up on the consumptive a little more. The lot of the poor devils is hard enough already without being held up as a danger to the community if they spit. We are heart and soul with the law against spitting, for its other evils are bad enough without blaming it for things it does not do.

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**The temporary immunity conferred by typhoid vaccine** is illustrated by the five cases which developed typhoid fever, three being severe forms, in Christian County, Ky., in 9, 10, 13, 18 and 21 months, respectively, after inoculation. The reporter, Dr. J. G. Gaither, (*Jour. Amer. Med. Ass'n.*, Oct. 10, 1914), said that these occurred among about 1,000 inoculated people and he is greatly puzzled that there should be such unsatisfactory results, whereas the Army had but three cases last year among 90,000 inoculated. He evidently suspects there are others in civil life for he asks physicians to report their cases so that an accurate judgment may be formed of the value of this procedure. Such cases have recently been reported by Thomson of New York (*N. Y. Med. Rec.*) and others and have occurred so frequently in India that the operation is advised yearly where the infection cannot be avoided. Christian County is evidently a hot bed of typhoid if five in a thousand contract it in a few months. At that rate New York City should have more than thirty thousand cases a year. It is quite evident that the vaccinated soldiers escape typhoid like unvaccinated New Yorkers—by splendid sanitation. Kentucky should learn that lesson. On the other hand,

the secretary of the Kentucky State Board of Health in reply to Dr. Gaither, says that 6,739 antityphoid inoculations were made under the direction of the board up to July 1 last, and not one typhoid has developed in them. He should have said that none had yet been reported, for he recommends repeating the operation every two years as though he expected some soon. It is certainly amazing that the editor should have referred Gaither's article for criticism to the secretary of the Kentucky Board of Health—who, without stating any facts in substantiation, has intimated that the failures were due to improper care of the vaccine. Such partisanship is developing something approaching a scandal. The procedure is too valuable to do anything to prevent our discovering its exact field of usefulness. These severe cases show there was no truth in the early reports that if an inoculated person did develop typhoid the disease was mild. Our other early opinions are in need of similar revision.

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**The ecto-parasites of man and lower animals** have been given considerable study recently and the discoveries have unquestionable medical relations which we would do well to consider in our studies of the transmission of disease. Prof. Vernon L. Kellogg of Stanford University, says (*Science*, Oct. 24, 1913) that there are two groups of wingless, permanent ecto-parasites, as distinguished from the fleas which hop from host to host and whose immature life is non-parasitic. Other biting animals, flies, mosquitoes, etc., are not included. One group of true parasites, the biting lice or mallophaga, feed on hair and feathers, and though nearly 2,000 species are known, they are chiefly on birds—only two are on lower monkeys and none on man or the anthropoids. As a rule, they

promptly die when transferred to man. Of the sucking lice, anoplura, less than 100 species are known and they are confined to mammals. Two genera, pediculus and phthirus, appear on man, and of the latter there is but one species which is confined exclusively to him. Of the six species of pediculi, two are confined to man, one to the chimpanzee, one to the gibbons and two to an American tailed monkey (*Ateles*). There are other pediculine species on other tailed monkeys. Kellogg has shown that as far as birds are concerned these parasites are distributed according to the genetic relationships of the hosts rather than geographically or by other factors. It was possible to show kinship of doubtful species of birds by the similarity or identity of their parasites. This now seems to hold for man and the anthropoid. The two are near enough related to have lice of the same genus, but are far enough apart to have different species, and man has a special one. The *Ateles* genus of monkeys seem to be an exception for they harbor lice nearly related to those of the anthropoids, but it is shown that these monkeys have great resemblance to the Old World anthropoids. Those diseases (typhus etc.) which are supposed or proved to be carried from man to man by pediculi, are thus peculiar to man and are not shared with the lower animals, like plague, which is carried by fleas which will attack both. This would seem to indicate that certain diseases which afflict man alone, might be carried from man to man by the parasites which are peculiar to him. Leprosy has been thought to be carried this way, and though the lower animals can be given this infection in the laboratory, they do not get it in wild life because no human parasite will bite them. It is an academic matter which might prove to be of great practical importance. At any

rate, there seems to be less ground for the fear that the true parasites of the lower animals transmit diseases to us. We have enough to worry about without this old fear. Our pets may not be as black as they are painted by the over-finical. Our diseases are largely confined to ourselves, and have been evolved with us since our anthropoid stage, and simple cleanliness is generally an efficient preventive of their spread. It is remarkable how rapidly the sum of scientific research is evaporating the dark fogs of old fears, dreads, phobies and imaginary horrors.

The slowness of changes of custom must be considered by all who are engaged in any of the modern movements for social betterment, lest too much be attempted and nothing accomplished. The old folks generally go on doing as they always have done, simply remarking that the old ways have sufficed so far and are good enough for them. Their children will learn better manners, and these are the ones to be educated, but we must wait for them to grow up and become "the people." Yet even here we are frequently disappointed and must wait generations. These thoughts are suggested by the fact that as early as 1832, Dr. Charles Caldwell of Lexington, Ky., published in the *Transylvania Medical Journal*, the fact that inebriety was a disease to be treated by physicians, and that the law should consider it a form of madness and provide special hospitals, where the curable could be restored to health and the incurable confined for life. Those ideas were old even then, and it is safe to say that it has required a century for them to be placed on a practicable basis. We hope that it will not require another century to universalize the plan of confining both tramps and drunkards.

**Eugenics** was also given much attention by Caldwell, particularly in his essay, "Thoughts on the True Mode of Improving the Condition of Man." He seemed to think that through the marriage of drunkards and other unfit, the race was deteriorating. To be sure the "stocks" of 1832 constitute but a small percentage of our present population, but their failure to maintain numerical supremacy is mainly due to other factors. Marriage of the unfit was equally prevalent and equally disastrous in Europe, but there were enough fit ones to keep the populations vigorous. They were not exposed to the conditions which have allowed the old settlers to become submerged by the new. So while we are at work on plans to prevent the known social damage of unfit marriage, let us try to find out why the fit ones of 1832 have not populated the land. At present it looks as though this part of America is to be the goal of a ceaseless immigration stream of labor material which earlier arrivals cannot furnish by reproduction. Here is a big field for medical research, and its workers should be given some of the encouragement now lavished on less important subjects.

restraints on conduct because a child's natural acts and wishes are often unwholesome survivals of what was once desirable in a prior adult environment. In lieu of catering to the old savage still in us, by plays of warfare, the pupils take part in the household duties of modern life from cooking to making the beds. Best of all, each child is subjected to periodical medical examination to see if it is developing properly. Abnormalities can thus be detected early and their further growth prevented. All this is reported of a school conducted in Highgate, England, by Mr. J. C. Hudson. It sounds ideal and if the curse of many English boarding schools has been eliminated—insufficient and improper food—perhaps it is ideal. No mention has been made of results, but we presume they are good or the matter would not have received the favorable press comment from which we quote. The utilization of a child's motor activities is the best part of the scheme—we learn by doing and not by being told how to do. Pedagogists no doubt will be greatly interested in learning of the results and we hope Mr. Hudson will report more fully. Our medical interest has been aroused by this new evidence of the rapid growth of the modern plan of supervising the child's physique and health. The medieval plan of actually torturing the poor little quivering frames by long hours on cruel benches in bad smelling, overcrowded dark rooms has gone the way of the children it murdered, but we have been discouraged at the slow growth—outside of the progressive American cities—of medical supervision. The doctor has been called in to cure what he is now required to prevent. We hope all boarding schools in America will take up this plan more vigorously—as the more progressive among them have been doing a long time.

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**The go-as-you-please outdoor school** is the latest variation of this magnificent system, but it is so dependent upon the personality of the teacher as to be of doubtful wisdom as a general plan for all to follow. The essential feature is that the child is not forced to do certain tasks at certain times, but is allowed to select its own time and way. It learns much but is taught little. Of course it must be taught some things, even many, as it could not get them of its own volition and in addition there must be some



## MEN AND THINGS

**Lemuel Bolton Bangs.**—The death of Dr. Lemuel Bolton Bangs of New York City on Oct. 4, 1914, removes one of



the older generation of genito-urinary surgeons, and one who has done much to raise this specialty to the high position it now fills. He has been a frequent contributor to the literature and edited the *American Text-book of Genito-urinary Diseases*. He graduated from the College of Physicians and Surgeons in 1872 at the mature age of 30—which fact should help to assure those who are complaining about the advanced age of graduation from the modern curriculum. He became surgeon to St. Luke's in 1877 and has been consulting surgeon to St. Luke's, Bellevue, City, St. Vincent's and Methodist Episcopal Hospitals, and professor of genito-urinary diseases at the Post-Graduate, and University and Bellevue. He was president of the American Association of Genito-Urinary Surgeons in 1895.

they express sorrow that their own respective nations had not armed themselves more. They argue that if they had spent upon preparation a fraction of what they have lost through lack of it their people would not now be largely refugees doomed to death by exposure and undernutrition. What has it profited them to gain the whole world of industrial property, to lose their own lives in the end? Peace advocates have repeatedly affirmed that every cause of war can be arbitrated and should be, yet the most prominent of them are now asserting that nothing but war can remove the alleged causes of the present conflict. They are firmly of the opinion that the peace of the world demands that one of the present belligerents be crushed. A hundred years ago they combined against France, a hundred years hence they will combine against some other nation.

The literature put out in the last few years by the American Society for the Judicial Settlement of International Disputes, makes interesting reading now. One would doubt the intelligence of the members of this society were they unknown men, but as they are the most prominent leaders in the country, we can only conclude that none of them has the slightest conception of why war periodically breaks out in spite of all efforts to prevent it. They point to a lot of trivial disputes settled by arbitration but nations always did arbitrate those things which are not worth a war, or when war is impracticable. This society would not be wasting good money if it would start a really scientific investigation of the reasons for the struggle for existence among nations.

Only a few years ago we were repeatedly informed that great wars were at an end and therefore armaments were a waste of

**The Psychology of War.**—The most curious of all the curious phenomena of the present war is the manner in which world famous pacifists, including socialists have become rampantly in favor of war—at least this war. For many years these well meaning folk have been making the most violent attacks upon armaments and now

money, yet this struggle for existence has caused the most appalling horror in the history of the world. It has started certain peace advocates to speculating as to when a still more horrible war will break out, and the only preventive they can suggest is the crushing of one belligerent and strengthening of another which in time will be just as dangerous to world peace.

Why do not these peace-lovers recognize the fact that war is a natural phenomenon, and then study its natural causes? It is a part of biology though our professors of biology do not seem to know it. Every one knows that war must continue as long as its causes. Men do not fly at each other's throats without some profound reason, which is part and parcel of their very nature. They are struggling for existence and some die in the attempt as they always have died. Modern civilization cannot do anything to make the struggle less severe until we find out the reasons for any struggle at all. Let our biologists get to work on the problem now that the sociologists have so miserably failed. Then we will see that the above curious psychological paradoxes are not paradoxes at all. The only trouble is the desire for the millennium long before we are fit for it.

**Preparation for War.**—The present war is bound to teach us many lessons we have hitherto neglected, but until peace is declared it will be unwise to say what they will be. Nevertheless, there is one which can be studied right now, and that is the desperate strait of those countries who have failed to train up a sufficient body of officers and men. The soldiers are enlisted to shoot the guns, but the officer's duty is to tell them where to shoot. The soldier can be trained in a few weeks or months according to what we want of him, and in that interval, the prepared enemy may gain an advantage which may decide the war. The training of an officer is a matter of years, and it requires a degree of intelligence and education possessed by only a small percentage of any nation. Those who are to do staff duty of organizing, equipping and supplying, require experience of many years, and only professionals can give the necessary time to it. What are we to do? The nation's opinion is against preparation, and

there is considerable evidence that this idea is strengthened by men who have unpatriotically come to America to escape military service in their native land. Consequently we will never wake out of the lethargy of fancied isolation and security until we have been attacked by some powers who need what we possess. In the meantime can we not learn from the Swiss, who have successfully resisted envious neighbors for centuries? Switzerland has no standing army and yet it is the most military land in the world, for every male of proper age and physique is a soldier of the regular army. His training begins in school. Throughout his life he has his uniform and equipment at home ready for the field at an hour's notice. They all know how to shoot, and those who study the art of war become officers. It is high time that we introduce military training as part of the public school course for it is said that conscription has done more for the soldiers than they have done for their country. The physical benefit of the drill is equalled by the hygienic advantage of instruction in military sanitation. Why not get out all the good there is in it? There are a few rather noisy people who assert that such a system fosters war, but China's history shows that the opposite course invites aggression. We have been so far removed from danger that we have floated in the clouds of idealism until we are incapable of realizing that modern transportation has brought us in contact with possible enemies. There was once a time when every citizen was a soldier and every soldier a citizen, but the course of civilization restricted fighting to a very small percentage.

This war is showing a return to the old ways by calling out everyone. It is not such a ridiculous thing then to demand some military qualification of voters. In spite of our strong approval of giving the franchise to women and physically disabled men, we are aware that in the last analysis a nation's course is determined by weapons. Every citizen is in duty bound to become a fair shot even if he cannot be a sharpshooter, and we ought to adopt the gun club idea so popular in Europe. Lord Kitchener instructed his officers to teach the recruits to shoot and never mind the drill. If they had all done their duty, they

would be near-soldiers before enlistment and precious time would not be lost as we lost it in the Spanish war and the Rebellion and in every other crisis of our short history. We hate militarism which suppresses civil control, but we strongly invite study of the universal militarism of Switzerland—the home of the Red Cross, and so many other civilizing influences. In the meantime the medical profession should do its share. We are not too radical in asserting that none should be given a license to practice surgery, medicine, or nursing, unless they show sufficient knowledge of military practice to be useful on the call to arms.

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**Anesthesia and anesthetics** have assuredly played an important part in the evolution of modern surgery. Without their aid it is certain that operative technique would be far from what it is to-day. Yet important as anesthesia undoubtedly has been and far reaching as its influence always will be on the outcome of every major operation it is surprising how the subject has been slighted by the general practitioner. This has not been due to any paucity of literature on anesthetics, nor to any failure to study surgical anesthesia from all standpoints. Indeed those who have given special attention to this topic have not only been most enthusiastic, but have urged with force and conviction the desirability of every medical graduate becoming thoroughly familiar with anesthesia in all its manifold details. But still the profession as a whole have gone on giving this subject only scant attention, content to leave its more thorough and detailed consideration to those having some special interest in its practical application and study.

At last, however, this important branch of surgical medicine bids fair to have its scientific and practical importance properly emphasized, for one of our foremost surgical publications, *The American Journal of Surgery* with its October number begins the publication of a 32-page supplement to be issued quarterly, and devoted exclusively to anesthesia and analgesia.

This supplement will be a complete journal within a journal, containing editorials, contributed articles, and communications,

abstracts, transactions of societies, and book reviews.

The supplement has been adopted as the official organ of the American Association of Anesthetists and the Scottish Society of Anesthetists, and it will also publish the transactions of other like societies.

The editor of this supplement will be Dr. F. Hoeffer McMechan, of Cincinnati, one of the founders of the American Association of Anesthetists, and a charter member of the New York Society of Anesthetists.

He will be assisted by a staff of well known specialists in anesthesia, among whom we would mention: Dr. James T. Gwathmey, New York; Dr. Willis D. Gatch, Indianapolis, Ind.; Dr. William Harper De Ford, Des Moines, Ia.; Dr. Charles K. Teter, Cleveland, O.; Dr. E. I. McKesson, Toledo, O.; Dr. Isabella C. Herb, Chicago, Ill.; and Yandel Henderson, of Yale University.

It is with genuine satisfaction that we learn of this new undertaking, for we fully appreciate the opportunities thus afforded for a splendid amount of constructive work. That this anesthesia supplement will win a pronounced and substantial success is certain for we know the enterprise and journalistic skill behind it. *The American Journal of Surgery* is to be congratulated on this new evidence of the faithful way it is serving not only its readers, but also the best interests of American surgery.

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#### **The Child and the Cinematograph.—**

As a result of an inquiry just made among its head teachers by a Lancashire elementary education subcommittee, it was determined, says a writer in the *Medical Times*, that the exhibitions are physically detrimental to the scholars, since they become less thrifty, acquire an unhealthy thirst for pleasure and are disinclined for steady work and effort. It is also stated that their eyesight is sometimes injured. There can be little doubt that in this country, as in England, habitual attendance results in moral and physical evil. The "movie" houses should be better regulated, for their suppression would be a calamity. In Germany, where a paternal government regulates the management of public places, it is ordained that no one under the age of fifteen years may visit a cinematograph entertainment.



## THE MECHANISM OF IMMUNIZATION.<sup>1</sup>

BY

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The main thesis of the ensuing monograph is this: That the mechanism which gives the human organism partial or complete immunity against bacterial disease comprises what may be called the cytogenic system—including lymphatics, bone marrow, and spleen—with its daughter cells the white and red blood corpuscles, which are the active agents, and with the liver as the excretory organ of the waste products incidental to the immunizing process.

The theory assumes that the entire cellular system of the organism—viscera, muscles, brain—may be considered as a secondary apparatus, standing as it were in the background, ready to supplement the work of the chief immunizing agents. So general an implication as the latter may seem to savor of the nature of a truism; but it will appear that the theory ascribes a specific and definite part in the immunizing process to the body-cells in general and in particular, attempting to trace the precise rationale of their activity. Equally

specific is the interpretation of the activities of the leucocytes and the red blood corpuscles, which are posited as the chief and controlling mechanism in the process of immunization.

The hypothesis of immunization thus summarized, being based on the activities of the cells, might appropriately enough be termed the Cytoclastic theory, were it not that the term seems too general and not sufficiently explicative. It might be termed the Corpuscular theory, in token of the rôle ascribed to both types of blood corpuscles, were it not that physical science has already usurped that term. To call it the Leucocytic theory would be quite inadequate, as it would credit only one member of the triumvirate, and would, moreover, signalize the least original portion of the theory itself. The term Erythrocytic theory would have somewhat greater propriety, as pointing out what is conceived to be the most important single agent in the immunizing process, and also as signalizing the most novel feature of the theory. But this term also is condemned by its obvious inadequacy.

On the whole, the term *Proteomorphic theory* is the most comprehensive and explicative one that suggests itself; inasmuch as the theory at all stages, and in its widest implications, has to do with the metamorphoses (mainly hydrolytic) of protein compounds.

<sup>1</sup>The preliminary announcement of a new interpretation of the rôle of the leucocytes and red corpuscles of the blood, in health and in disease; to be known as the Proteomorphic theory.

It was through study of proteoclasia, mainly—in connection of course with the fairly wide survey of a good many allied fields—that the theory itself was elaborated. But for the data supplied by study of proteolytic activities, in connection with the metabolic processes of normal and abnormal digestion and assimilation, the theory could not have been conceived. So the word *proteomorphic* may be used to designate it with peculiar propriety.

We may add that the theory is the direct outgrowth of a long series of laboratory experiments, including study of the proteolytic activities stimulated by the hormone *secretin* acting on trypsin and bile salts *in vitro*; coupled with extensive clinical observations of the effect of the same hormone in stimulating leucocytosis and erythrocytosis in cases of Graves' disease, with attending amelioration of the distressing symptoms of protein poisoning characterizing that malady. It will appear in the course of the following exposition that these and a good many other laboratory and clinical observations hitherto utterly obscure or but vaguely interpreted find clear and tangible explanation when viewed in the light of the proteomorphic theory.

It will be shown that the precise rôle of the leucocyte on the one hand and the side-chain mechanism on the other are interpreted from a new point of view; that the red blood corpuscle is conceived to enter into the scheme of immunization as a masterful and dominating force, with all-important activities never hitherto ascribed to it; and that, as a whole, the scheme of immunization here presented has—if its tenets be accepted—a measure of comprehensiveness in the interpretation of the findings of physiologist, bacteriologist, and clinical pathologist that could not

well be claimed for any theory of immunization heretofore submitted.

In the sense that it explains and interprets several series of seemingly variant and discordant observations, co-ordinating them in a somewhat novel way, harmonizing their seeming discrepancies, and pointing out their wider implications; and that in so doing it appears to furnish a guide for future lines of research, it may fairly be termed, a new and original theory. We venture to hope also that it will prove, under the acid test of the future, to be a true and useful one.

It is the purpose of the present paper to present a brief preliminary outline of the evidence for the Proteomorphic theory, drawn from various fields of biology and pathology.

In collating the evidence it will be necessary to summarize the results of experiments and observations gleaned from many different sources, some of which must necessarily be familiar to all medical readers, and all of which will perhaps be familiar to a few. This is unavoidable if the evidence in its totality is to be made generally comprehensible.

It will appear as we proceed that much of this evidence is indirect or circumstantial; yet in the aggregate, we believe, it establishes a strong presumption in favor of the validity of the theory advanced. And if the theory is accepted, certain very definite and rather important inferences as to practical therapeutic applications follow as matters of course.

#### FACTS AND THEORIES OF IMMUNITY.

For generations physicians have been aware that an attack of a contagious disease tends to give the subject immunity against further attacks of that disease. The dis-

covery of Jenner gave an inkling of the possibilities of preventing disease by inoculation, but this purely empirical procedure did not lead directly to any extension of the method. It was only after the bacteriologist had discovered the tangible cause of disease that a way was found to produce artificial immunization.

In 1887 Pasteur startled the world by demonstrating that a virulent bacillus could be attenuated as to its virulence by cultivation in an artificial medium, and that an animal inoculated with the virus thus produced was given immunity from the disease, even though subsequently inoculated with virulent germs. In 1890 Behring discovered that the blood of an animal thus immunized has power to transmit the immunizing principle, whatever it might be, to another animal if the blood serum of the immune animal is injected hypodermically or intravenously. The diphtheria antitoxin thus developed by Behring, and a tetanus antitoxin discovered by Behring and Kitasato, were soon added to the armamentarium of the physician.

At about the same time, Ehrlich conducted his classical series of experiments with vegetable poisons, notably ricin and abrin (the toxic principles, respectively, of the castor-oil bean and the seed of jerquirity). He found that an animal inoculated with either of these proteid substances developed an immunizing principle which, when mixed with the poison itself *in vitro* neutralized the poison. It was necessary to make the admixture in certain proportions, thus showing the chemical nature of the reaction. Ehrlich thought of the phenomenon in chemical terms; yet, for the purpose of bringing the matter vividly to the attention of the profession, he devised a mechanical scheme in explanation of the

phenomenon of immunity which soon found almost universal acceptance, and which is often incorrectly thought of as suggesting something quite different from chemical combinations.

Ehrlich's tangible diagrams showing his "receptors" of the first, second, and third order; his haptophores and toxophores; his zymorphous and complementophile groups of the complex—all depicted as tangible structures some of them resembling hungry polywogs biting eagerly at inviting bits of protruding protoplasm of just the right size to make a mouthful—proved altogether alluring. A glance at such a diagram enables one to form a clear mental picture of the relations of receptive cells and complement and immune bodies in happy disregard of all possible chemical complexities.

In due course numerous workers proved the universality of application of the principles of the formation of the antibodies through the introduction of toxic agents into the organism. We learned of antitoxins, antifermenents, cytotoxins, agglutinins, precipitins, and opsonins in the normal blood serum or developed specifically in response to the invasion of toxins; then it appeared that there may be anticytotoxins, antifermenents, etc.; in bewildering profusion. And it was at least suggested that were our means of investigations sufficiently delicate we should find anti-antibodies in unending series, each new antidote becoming in turn a toxin and requiring an antidote; and the organic laboratory proving quite capable of developing series of such responsive mechanism *ad infinitum*.

To add to the confusion, different workers gave different names to the substances revealed in the course of their investigations; and in many cases they were talking of the same thing in terms of a

different nomenclature. Thus the ferment that Ehrlich calls addiment was named by others alexine, by still others cytase and yet again complement—the last name being the one ultimately adopted by most authorities.

In the same way the immune bodies came to be known as amboceptor, copula, desmon, hilfskörper, zwischenkörper, fixateur, substance, sensibilisatrice, etc. And it became a matter for dispute as to whether agglutinins, precipitins, and opsonins are identical one with another, and also as to the relations that these substances—recognized only by their effects—bear to the various hemolysins, bactericides, and bacteriolysins.

Out of the confusion, however, emerged pretty clearly the conception that there are two types of so-called bodies or chemicals involved in the immunizing process. One of these is a ferment-like substance which is thermolabile, its action being prevented by heating to a temperature of about sixty degrees centigrade; this substance being conveniently referred to as the complement. Joined with the complement in the immunizing process is a thermostable substance which may be comprehensively termed the immune body which apparently includes agglutinins, opsonins, and bacteriolysins (whether or not these are identical). The thermolabile complement is non-specific, in the sense that the same complement may unite with many types of immune bodies. But the thermostable immune body is specific, in the sense that it is evoked in response to a specific protein or toxin (called an antigen), and is antidotal to the particular antigen that evokes it alone. A bacteriolysin, for example, evoked in response to the typhoid bacillus will not destroy the tetanus bacillus.

The validity of the conceptions associated with these terms is not to be questioned. Multitudes of experiments have shown that the terms "complement" and "immune body," and the ideas associated with them, are compatible with observable phenomena of the bacteriological world. The assumption that active complement must be present in order that immune body may be linked with the toxic agent to neutralize it, finds support in such practical work as Widal's agglutinating test for typhoid fever and Wasserman's fixation-of-the-complement test for the diagnosis of syphilis. The conception that the toxic molecule has a "haptophore" group and a "toxophore" group and that the cell has receptors of a typical mechanical structure on which the haptophores adjust themselves is so tangible that it makes immediate and strange appeal to the imagination, or, better stated, it makes it unnecessary to call the imagination into play at all, the diagrams supplying its place.

Unquestionably these diagrams have proved very useful, and the entire mechanical conception has done much to promulgate widely a more or less comprehensible conception of the mechanism of immunity. But it is at least an open question as to whether these diagrams have not now served their purpose, and whether it may not be well to revert to a somewhat different point of view, and, ultimately to adopt a terminology more in keeping with the expression of chemical ideas in general. For of course it would be absurd to imagine that the mechanical diagrams have any representation in the world of fact. They are figments of the imagination, and may serve some such useful purpose as picture blocks serve in teaching a child the alphabet. But as the time comes when the

child puts aside the blocks and takes in hand the pen, so pathologists must ultimately lay aside the crude mechanism of haptophores and amboceptors and learn to deal with the phenomena of immunity in terms of the protein molecule and the chemical atom.

#### PROTEIN METABOLISM.

To be sure the chemistry of the protein molecule is by no means as clearly understood as might be desired, even by specialists in biochemistry. But the researches of many workers in recent years have resulted in tearing the molecule apart in the laboratory, and in revealing the major part of its primary constituents. We are now gaining an inkling as to what really happens when proteid foods are taken into the digestive tracts and subjected to the digestive ferments. And we are beginning to realize that the subject has supreme importance from the standpoint of the student of infectious diseases, for the simple but all-sufficient reason that the microbic agents that cause these diseases are themselves protoplasmic bodies—that is to say, compounds of protein.

When we reflect that there are always myriads of these proteid bodies in the digestive tract; and that legions of them on occasion find their way into the vascular system, and are there digested, the pertinence of the topic, in relation to protein metabolism, becomes evident.

And from the present standpoint the chief interest centers on the fact that there is in the human body one set of cells and one only that has been demonstrated to be able to digest and metamorphose the bacterial proteins when once they have invaded the blood serum—namely the leucocytes. What the ferments of the digestive

tract accomplish in the case of the food proteins, is accomplished by ferments of the leucocyte in the case of the bacterial proteins with which it comes in contact.

We shall suggest presently that the function of the leucocyte in this capacity is far more general, having to do with the metamorphosis of many types of protein in addition to those that come with the bacteria; but for the moment it suffices to call attention to the fact that the leucocyte is demonstrated to be able to deal with complex proteins, inasmuch as it is observed to engulf and assimilate protein-bearing bacteria *in toto*.

That the leucocyte actually performs this feat, was first demonstrated by Metchnikoff, and has been re-demonstrated thousands of times over in recent years, notably by the students of vaccine therapy. But the significance of this phenomenon, in its broader aspects, although at least partially conceived by Metchnikoff himself, was largely overlooked by his successors.

It must not be understood, however, that the capacities of the leucocyte as a proteolytic agent have been altogether ignored by recent workers. On the contrary, it is probable that some of the physiological chemists have ascribed to the leucocyte in this connection a larger measure of activity than it actually exercises. Thus Hofmeister, stimulated no doubt by the discoveries of Metchnikoff, was led to ascribe to the leucocyte the all-important function of taking up the peptone believed (erroneously) to be absorbed through the intestinal wall, and converting it into protein either directly or with the aid of the adenoid tissues, thus making it available for assimilation by the body cells in general.

The peptone molecule, it will be recalled, is a cleavage product developed from the

original protein molecule of a food protein hydrolyzed through the agency of the digestive ferments of stomach, upper intestine and pancreas. The molecule of peptone has a molecular weight of only about four hundred, being therefore about one-fortieth the size of its parental protein molecule. To conceive that the leucocyte habitually takes this relatively small molecule as its building stone and elaborates the complex protein molecule the molecular weight of which runs high into the thousands—and does this in case of all the protein that the body utilizes—is to make an assumption that at the least seems amazing.

Yet Hofmeister thought that he found justification for this assumption in the fact that there is a marked postprandial leucocytosis. If the leucocyte does not perform the function of completing digestion of the food and facilitating assimilation, he argued, why should the number of leucocytes be habitually increased after a meal?

His reasoning seemed so valid that he has a good many followers. Cramer and Pringle, for example, and Noël Paton believe that the leucocyte plays a very important part in the assimilation of the protein food-products; and Pavy elaborated the hypothesis, arguing that the entire conversion of the food peptones into body protein was brought about by the leucocytes.

The particular type of leucocyte believed to be chiefly involved is the lymphocyte, it having been shown by Paton, Goodal, and Gulland that the most marked postprandial increase in leucocytes occurs among the lymphocytes, although there is also increase among the polymorphonuclears.

It is interesting to add that the leucocytic recruits come, according to Paton and Goodal, not from the intestinal lymphatic tissue, but from the marrow of the bones.

Their development is stimulated, we must assume, either through the agency of the sympathetic nervous system or in response to a hormone sent out from the intestine. In our opinion the hormone that produces this effect is the *secretin* of the duodenum, which is known to have a similar stimulating effect on the secretions of the pancreas.

Pavy developed the hypothesis, which Noël Paton has also advanced, that the leucocytes after synthesizing the proteins, undergo autolysis, thus discharging their proteins into the blood, to furnish material for the tissue cells.

The present writers believe that there is a measure of truth in the latter part of this hypothesis, referring to the autolysis of the leucocyte. We have witnessed such autolysis of leucocytes seemingly engorged with proteid pabulum under the microscope. But we do not believe that the leucocyte (in its mature state) synthesizes protein; nor that the main function of handling protein-products of the intestine is dependent upon the leucocyte. As to this, Halliburton's suggestion, to the effect that the number of leucocytes in the blood stream is inadequate to perform this function in its entirety, seems fairly conclusive. Halliburton argues that the total blood stream contains only about one gram of lymphocytes; and even if this amount were doubled during digestion, "it is difficult to see how two grams of lymphocytes can tackle the enormous burden which every meal must put upon them."

According to the present view, the leucocytes are not called upon to "tackle" this problem, which is handled effectively by the mother cells that generate leucocytes and red corpuscles, notably the latter. These mother cells (in bone marrow, spleen, and in case of certain leucocytes lym-

phatics) synthesize protein from its amino-acid elements in great quantity, as evidenced in the bodies of the corpuscles themselves. But the province of the mature corpuscles is to deal with proteins in a quite different way.

Their task is not that of synthesis but of proteolysis, and it is exercised, not in connection with the regular supply of food proteids, but (1) with bacterial proteins and (2) with exceptional increments of unbroken or only partially cleaved food proteins that find their way by inadvertence into the vascular mechanism, and (3) in case of the lymphocytes, with the proteolysis of the normal serum proteins.

According to the view to be elaborated as we proceed, the polymorphonuclear leucocyte deals with the unbroken proteins (bacterial or dietetic); the red corpuscle with partially cleaved molecules of the polypeptid order; and the lymphocyte inaugurates the decompounding of the normal serum proteins, to supply energy for the activities of the digestive organs, the muscles, and the tissues in general.

The evidence on which these novel opinions are based must be presented somewhat in detail.

#### PROTEOLYTIC ACTIVITIES OF THE LEUCOCYTE.

The work of Miss Van Alstyne has shown, in corroboration of earlier experiments, that, under certain conditions, unmodified food proteins may find their way through the intestinal walls and enter the general circulation. It is against these, according to our view, that the digestive function of the leucocyte is exercised; the work of the leucocyte with these, as with the bacterial proteins, being a work of pro-

teolysis strictly comparable to that performed by the digestive ferments in case of proteids in the digestive tract—with certain variations to be noted.

This view finds strong support in the fact that one at least of the enzymes found in the body of the leucocyte is closely comparable to, if not identical with, the trypsin of the digestive canal. It is possible, according to some experimenters, that synthetic activities also lie within the capacities of these enzymes (all catalytic phenomena are conceivably reversible). We have seen leucocytes in a proteid pabulum grow in size and multiply by division, implying the transformation of foreign protein into the body-protein of the leucocyte itself. But even here they were dealing with the full sized protein molecule, and, assuredly, their habitual province is to break down or cleave this protein molecule, not to synthesize it.

This, we believe, is the work that the leucocyte is called upon to perform.

It is known that the unbroken food protein, and even so small a cleavage product as peptone, do not exist normally in the blood stream. The peptones of the digestive canal are believed to be further hydrolyzed, with the production of amino-acids, in their passage through the intestinal wall. The leucocyte accomplishes the same cleavage (or at all events the early parts of this cleavage) in the case of foreign proteins that come to it. And the quantity of these is sufficient to give full scope for the leucocytic activities; for such experiments as those of Miss Van Alstyne show that the intrusion of the unbroken protein molecule must be an extremely common incident, even if it cannot be considered a strictly normal one. Moreover, there are complications involved in the task of disposing of these unwelcome visitors.

The first of these complications is contingent on the fact that the leucocyte is thus called upon to deal with large protein molecules of many types, and that it can scarcely be supposed to be able to do so without producing toxic cleavage molecules at some stage of the process that may escape from its substance—say through dissolution of the body of the leucocyte itself—and contaminate the blood plasma. Even though the original protein was in the form of a wholesome food stuff, say protein of beef or of egg or of milk, there is always possibility that in its decompounding there may arise combinations of molecules that are poisonous to the tissues of the organism.

As Vaughan phrases it, there is a poisonous group in every protein molecule.

Possibly it would be correct to say that there are many poison groups; but Vaughan finds their physiological effects are essentially the same in all proteins. He has attempted to isolate this group of molecules which, in its free state becomes a poison on account of the avidity with which it disrupts other protein molecules. In the purest form in which he has been able to isolate this group (and this is probably, he conceives, far from chemical purity), it kills guinea pigs of from two hundred to three hundred grams weight, when injected intracardiacaally in doses of half a milligram. In the original protein molecule, it is held, the poisonous group is physiologically inert because it is combined with secondary groups called side-chains. But these secondary groups are detached or decompounded in the proteolysis of the molecule; and there is obvious danger that during this process the poisonous group may become detached and, diffusing in the blood stream,

exert a toxic effect on the central nervous system.

The danger of such a result when proteins are digested in the alimentary tract is small, because the poisonous group is probably not readily absorbed through the intestinal wall. But the leucocyte itself is suspended in the blood stream, and it must on no account permit the formation of a poisonous group, or if such is formed it must be retained within the substance of the leucocyte until it is further transformed and rendered innocuous, or is otherwise guarded (for example by the red corpuscles) or extruded from the blood stream.

Something as to what this implies may be conceived from an attempt to visualize the protein molecule, even in the vaguest way. A typical protein, for example, is globin, the basis of hemoglobin. Plummer gives this formula for globin: C<sub>726</sub>, H<sub>1174</sub>, N<sub>194</sub>, S<sub>3</sub>, O<sub>214</sub>. In the process of digestion, this enormously large and complex molecule undergoes hydrolytic cleavage again and again. A single molecule of protein thus cleaved (always in such a way that each new molecule contains a modicum of nitrogen along with the other elements) makes up successively molecules of proteoses and of peptones and polypeptides, and ultimately, if the cleavage is carried far enough, the disintegrated fragments constitute the relatively simple amino-acids, which form the building stones of all proteins, and of which almost a score of different types are now known, a few of which have become reasonably familiar in recent medical literature under the names of glycine, alanine, valine, leucine, tyrosine, etc. The simplest of these, glycine, has the formula C<sub>2</sub> H<sub>5</sub> N O<sub>2</sub>; but the others are not much more complex; leucine, for ex-

ample, being fairly typical, with the formula C<sub>6</sub> H<sub>13</sub> N O<sub>2</sub>.

It will be seen, that something like two hundred molecules of the amino-acids—each with its single atom of nitrogen—would result from the final cleavage of a single ordinary protein molecule. So the digestion or proteoysis of even a small group of protein molecules is like the tearing to pieces of a building composed of many thousands of individual bricks, stones, and timber. It is obvious that the task thrust upon the leucocytes by the intruding protein molecule is by no means a simple one. Yet there is abundant experimental evidence that such proteolysis of an invading protein does take place parenterally; and to the present writers, at any rate, it seems highly probable that it is the leucocytes, rather than any of the more specialized tissues, that perform this function.

The fact that only small quantities of foreign proteins, if experimentally introduced into the blood stream, are transformed (the major part being excreted by the kidneys unchanged), is obviously consonant with the relatively small bulk of the leucocytes in their totality, as above referred to.

It is by no means certain that there does not remain a residual molecule or two, after final cleavage is effected, that is actually toxic. But if so, it is a molecule with which the body has learned to cope by bringing about its early elimination. (We shall suggest the way in which this is believed to be effected through the agency of the red corpuscle). Save for this small hypothetical residual portion, the protein molecule will have been transformed into amino-acid foodstuffs which, we may suppose, do not differ in any essential particular from those

supplied in far larger bulk from the usual digestive-tract proteolysis of the proteins, including the stages of dismemberment effected in the walls of the intestine itself during absorption.

#### THE LEUCOCYTE AND BACTERIAL PROTEINS.

But the task of the leucocytes in shielding the tissues against the intrusion of unwelcome proteins in non-assimilable form becomes enormously implicated when the proteins in question are of unfamiliar types and are encased in protective cell walls—in other words, when they make up or enter into the bodies of bacterial invaders. As already pointed out, however, the capacity of the leucocyte to engulf these bodies and to digest them and make them part of its own substance is not at all a matter of theory, but a matter of observation under the microscope.

According to our idea there is no fundamental difference between the digestion of the bacterial proteins and of any other type of protein—say a morsel of muscle. There are practical difficulties to be solved, such as getting through the cell wall of the bacterium, but the transformation of its protein, through cleavage, into amino-acids is a process of the same general type as any other proteolysis.

As qualifying this statement somewhat, however, it should be borne in mind that no two proteins from different sources—from the bodies of different species of animals for example—are identical as to all their groupings of molecules. Nuttall's remarkable precipitin experiments show how marvelously the specificity of proteins holds throughout the animal kingdom. So although the single enzyme trypsin is observed to begin the digestion of many types of

protein, it must be supposed that the exact steps of the successive metemorphoses are somewhat different in each case. It is even possible that there are various types of the enzymes that now go by the name trysin, each one adapted to deal with a different protein. But this is only conjectural, as the chemistry of the enzymes is still very obscure.

Be that as it may, however, it is certain that each type of protein undergoing parenteral digestion and assimilation evokes from the digestive mechanism a unique response, which finds expression in the secretion into the blood stream of specific types of antibodies. These specific antibodies are no mere byproducts of the cleavage of the foreign proteins, as was once supposed. They are chemical compounds put forth by the defensive mechanism and having such specific properties as will enable them to antagonize the particular protein that evoked them. This is equally true of proteins of every type—of the molecules that make up the most wholesome foodstuff no less than of those that make up the most virulent bacillus.

The chemicals in question are known as bactericides, bacteriolysins, hemolysins, agglutinins, precipitins, and opsonins. Some of these names may be duplications, but the existence of a certain number of what may conveniently be termed, "antibodies," developed through response of the organism to the intrusion of the foreign proteins, is a chemical fact supported by unassailable evidence, quite apart from any theory whatever as to the precise bodily mechanism through which they are produced.

But when we attempt to localize this mechanism, we find ourselves at once involved in difficulties. To be sure the line of reasoning just presented seems to point

rather clearly to the leucocyte as the developer of the antibodies; inasmuch as that cell is known to be the digester of the offending protein itself. But if we seek direct proof, we find the evidence not altogether convincing. Nevertheless a number of observations have been recorded by us, as to the result of direct experiments, that are at least highly suggestive.

Thus, for example, Ruffier and Crendropoulo, as cited by Nuttall, found evidence that agglutinins may exist in the leucocytes of rabbits and guinea pigs, inasmuch as an extract of leucocytes from an immune animal had greater agglutinating power than did the same animal's serum. The observations of Metchnikoff convinced him that the output of "fixitives" varies directly with the degree of phagocytosis. Gengou, following up Metchnikoff's conception at the Pasteur Institute, "concluded that the hemolysins are derived from leucocytes, for the reason that plasma separated from fresh blood, when cooled throughout, by centrifugalization, was less hemolytic than serum." The experiments on which this last conclusion were based were repeated, however, by Ascoli, with opposite results, and Pfeiffer and Marx found antibodies less abundant in the ground bodies of leucocytes of immunized animals than in the plasma.

Again according to a recent analysis of Gay and Rusk "the work of Deutsch, Castellani, Rath, Weil and Braun, and Kraus and Schiffmann all shows that the agglutinins appear in the blood serum before they are present in the extract of any organ." But "although Gruber originally suggested that the polymorphonuclears form the agglutinins no experimental evidence goes to prove this, and the experiments of Achard and Bensaud, Widal and

Sicard, of Paetsch, and of Kraus and Schiffmann all seem to disprove leucocytic or local origin."

"Sweet found that he could increase the complement-content by the injection of substances having a positive characteristic action on leucocytes." (Nuttall).

As to precipitins there are experiments by several observers (including Cantacuzène and Swerew, Hiss and Zinsser, and Stenstrom) seeming to point to the leucocytes as a definite source; and Kraus and Schiffmann "emphatically regard the blood as the source of precipitins." Here again there is contradictory evidence; but on the whole it may be said that a strong case is made out for the leucocyte as the source of precipitins and agglutinins, and a somewhat less convincing case for bacteriolysins and hemolysins. We shall have occasion presently to refer more at length to some recent experiments of J. W. Vaughan in which antibodies evoked by cancerous tissues were definitely located in the large mononuclear leucocytes.

Meantime it is to be noted that a considerable number of the workers who failed to localize the immune bodies in the leucocytes found evidence for their localization in one or another of the leucocyte-forming tissues—the spleen, the lymphatics, and the bone marrow. Thus, according to Nuttall, "Shibayamia found hemolysin for dog corpuscles in the spleen and lymphatic glands of normal guinea pigs, not elsewhere."

Again Gay and Rusk interpret the work of Pfeiffer and Marx as seeming "to indicate very clearly that the protective antibodies directed against the cholera spirillum are elaborated in the leucopoietic organs, particularly in the spleen, but to a less ex-

tent in the bone marrow, inasmuch as extracts of these organs protect guinea pigs from infection before the blood serum does. Deutsch essentially corroborated these findings with *B. typhosus* and Castellani with *B. dysenteriac*..... These authors agree that the spleen is not essential, as its removal at best but slightly inhibits antibody formation; the bone marrow and lymph nodes are secondarily concerned."

As to hemolysins, we find this comment: "Among the fixed tissues, the liver and spleen seem to have shared the honors as the possible sites of hemolysin formation. Leuckhardt and Becht, following the work of Hektoen and Carlson, found that the spleen alone of the organs of a dog that has received goat or rat corpuscles 24 hours previously has the property of immunizing new animals." But this experiment is not considered conclusive. "Carrel and Ingebrister have produced hemolysins in the growing embryonic spleen." As to agglutinins, it is noted that "there is some evidence of agglutinin formation in the spleen offered by V. Emden, Jatta, and Girgoleff."

All this is interesting; but there are contradictory experiments all along the line, and Gay and Rusk do not regard the evidence on the whole as conclusive. They say, however: "there seems greatest agreement on the point that antibodies are formed either by the leucocytes or the leucocyte-forming organs. And yet a good deal of recent work points with increasing emphasis to the liver, an organ which, in view of its other functions, might logically likewise serve to produce antibodies."

It will appear that the conflicting testimony is largely harmonized so soon as we take account of the red corpuscles along with the leucocytes and cytogenic system.

For the moment, however, it suffices to point out that all the different experimenters are at one in designating either (1) the leucocyte-forming organs, or (2) the leucocytes themselves, or (3) the liver, as the probable sources of the origin of antibodies. As to the liver, we now call attention to the fact that this organ is the seat of destruction of great numbers of red blood corpuscles; and that its fluids are very freely supplied with leucocytes, some of which come to it directly through the portal vein after their apparent origin in the spleen. It has even been suggested (by Sajous) that the eosinophiles may be formed in the liver.

All in all, it may fairly be said that the experimental evidence raises at least a strong presumption in favor of the belief that the lymphoid tissues that develop the leucocytes, and the leucocytes themselves, are at least closely associated with the processes through which certain types of antibodies are developed. The antibodies in question according to the Proteomorphic theory, are the "complement" and sundry bactericides, bacteriolysins, agglutinins, opsonins, and precipitins—in a word, the antibodies evoked by antigens composed of unbroken proteins, including, of course, the bodies of living and dead bacteria.

If the direct evidence for this part of the theory is not absolutely demonstrative, at least it may be said that there are no experiments that clearly contradict it. Meantime, it is worth while to inquire whether the general relations of the leucocyte and its parent cells, viewed in the evolutionary scale, are such as to justify the assumption that they perform the particular functions here ascribed to them. Such a discussion could of course have no force were it contradicted by direct experimental

evidence; but it may have confirmatory value when its findings seem to accord with those of the experimenters.

In such a view, it would appear that the leucocyte is a relatively unspecialized cell, the least-modified present day representative of the prototypal single-celled ameboid organism from which the entire body has developed. It is consistent with this view that the leucocyte should have retained the primitive functions of digestion and assimilation of proteid bodies as its essential task in the developed body.

It is not unlikely, then, that in reviewing the conditions which determine the relations of the protozoan to its environment we may gain an insight for the better interpretation of some of the activities of the leucocyte, its lineal descendant.

If, then, we go back to the evolutionary beginning, and review in imagination the conditions of the time when the only living organisms were single-celled ones, we must think of our primordial ancestor as a protoplasmic cell endowed with a curious capacity to absorb certain materials from the environment, and through assimilating them to grow; endowed, also, in the pursuance of this mission, with capacity to respond to impressions received from the environment.

The protoplasm making up the body of this primitive organism was a compound of carbon, hydrogen, oxygen, and nitrogen, with minute quantities of a few other chemicals, notably sulphur; which was liquid in character, but differed in its essential qualities from the inorganic substances about it, chiefly, we may suppose, because of the exceedingly intricate character of the relations of the very large number of atoms that entered into each molecule. The physical principles that determined the re-

lations of this protoplasmic solution with other solutions in which it might be immersed were determined in accordance with the laws of capillary absorption and of osmosis.

The essential functions of the protoplasm, in virtue of which it might be spoken of as a living organism, were probably contingent on the fact that each molecule contained a large number of atoms of carbon, an element having four chemical valences; and a considerable number of atoms of nitrogen, an element that may have either three or five valences, and which is signally characterized by its unwillingness to enter into combination, and, contrariwise, its exceeding desire for liberty when once it has been combined, resulting in the instability of all nitrogen compounds. All explosive compounds, it may be noted, contain a nitrogen element. Indeed, the analogy as to composition, between protoplasm and dynamite and other high explosives is striking and highly suggestive. There is one important difference, however—artificial explosives contain enough oxygen to burn their other constituents; whereas the protein molecule, in order that it may not be too unstable, is provided with a comparatively small supply of oxygen.

Recall now the principles of osmosis, as revealed by the studies of Van't Hoff. It appears that osmosis, or the passage of liquid through a membrane from one solution to another, is due, not to any suction principle, but to the pressure on the membrane exerted by the molecules of the denser liquid; that is to say, the liquid which has the larger number of free molecules in a given volume.

A single liberated atom or ion of oxygen or any other element is the osmotic equivalent of the most gigantic protein molecule.

This is the curious fact discovered by Van't Hoff, and substantiated through the researches of Arrhenius and Ostwald. It is of fundamental importance in its application to the relations of the living cell.

Suppose, for example, that a full-sized protein molecule in the protoplasm of a living cell were suddenly to be disrupted into molecules of its component substances, the amino-acid. Immediately the osmotic pressure exerted by the molecule would be increased a hundred fold. The pressure might disrupt the cell. Short of that, it would result in pressing the cell wall outward against the surrounding fluid, with the result that a certain amount of that fluid would pass through the cell wall and become a part of the cell content. Suppose, then, just as equilibrium of pressure between the cell and its surroundings is re-established, there is a recombination of the dissociated elements to produce full sized protein molecules. A hundred or so amino-acid molecules becoming a single protein molecule, the osmotic pressure in the cell would be correspondingly reduced, with the result that the cell would contract under stress of outside pressure, and exude a portion of its content.

It is not unlikely that this process may explain the enigmatic action even of such highly developed cells as the muscle cell in the animal body, the contraction of which has never been clearly understood. It certainly explains many of the fundamental processes of assimilation. It should be added, however, that in a comprehensive view, the character of the cell wall itself must not be overlooked. The permeability of this is an important consideration; and it has been found that the nature of the medium in which it lies, notably with reference to mineral salts, may greatly modify

this permeability. At the moment, however, this aspect of the subject need not be examined in detail.

It is obvious that our primitive bit of protoplasm, under the shifting conditions of osmosis, expanding and contracting as portions of its protein content are dissociated and re-formed, may have acquired, in virtue of this principle alone, a certain function of primitive motion. Granted a group of unstable carbon-nitrogen compounds en-cased in a cell wall, we have a primitive organism which may manifest the fundamental conditions of assimilation and excretion.

The precise chemical composition of the cell-content making up the body of this living organism, in connection with its fundamental proteins, will depend upon the chemical composition of the medium in which it lives, and from which it absorbs matter, and into which it excretes residual matter. And in any case in which the mechanism of absorption and excretion of a given cell-laboratory has reached a status of equilibrium, the intrusion of any new chemical substance into the medium must serve as a disturbing element.

Suppose that this disturbing element takes the form of another organism, which has been accustomed to a different medium, and hence which has developed a somewhat different chemical composition, to the extent at least of modifying the side-chains of its protein molecule. Then, in the nature of the case, there must be a certain antagonism between the two organisms. Each, through its excretions, modifies somewhat the character of the medium, and makes it in a sense an abnormal medium for the other. Unless both organisms are able to modify somewhat their previous mode of existence, finding a way either to assimilate or to neutral-

ize the abnormal elements now introduced into the medium, they cannot survive.

If either of them does survive, that fact is proof positive that the organism in question has found a way to adapt itself to the new conditions. It has so adjusted and modified the regular routine of its internal chemical processes, that the excretions of the other organisms are no longer noxious to it. If we choose, we may say that the organism has developed antibodies or anti-toxins against the offending neighbor organism. Thus it would appear that the production of such antibodies must be one of the most fundamental and primordial of life processes. It is a function that is retained throughout the history of all descendants of the protozoan, even to the remotest cell of the highest organism.

The reason for this is not far to seek; for it is a familiar axiom of the evolutionist that all life is a struggle; and it is obvious that the developing organism must come constantly in contact with other organisms. With each new one, the old struggle must be renewed with slightly new aspects, and new methods must be found to equalize the adverse conditions introduced.

As the organism evolves to a multi-cellular condition, and develops the various members and organs that mark the higher animals, it will pass constantly to new environments and come in contact with new enemies. Every time it encounters a new type of food, be it vegetable or animal, it will present a new problem to its chemical laboratory of the digestive and the assimilative system. And unless this chemical laboratory proves adequate to the new task put upon it, the organism will die.

It follows that every existing organism has been able to run this gauntlet and to

find a solution of the new problems presented to it.

In other words, every existing organism has learned to digest and assimilate a great variety of proteins; developing mechanisms for neutralizing their poisons, until foods that were toxic have now become wholesome.

In this view, it will be observed, there is no suggestion that one kind of protein rather than another is poisonous. It is simply that each specific type of protein is somewhat antagonistic to organisms composed of any other type of protein. It is only a cannibalistic protein diet that can be said to be intrinsically harmless. But cannibalism involves the penalty of probable race extinction; and so in the nature of things evolutionary all living organisms have learned to feed on the protein of other races of organisms, adapting their own metabolic processes until they are able to deal effectively with the offending side-chains in the foreign molecule. Such a process of adaptation requires time, and we may take it for granted that foreign proteins are "wholesome" to any given organism somewhat in proportion to the length of time during which the ancestors of that organism have been accustomed to ingest it. That any given protein food is observed to be non-toxic is in itself proof positive that the organism is equipped with an immunizing mechanism adapted to deal with the specific minor combinations of atoms that make up the side-chain components of its protein molecules.

Nor does this apply exclusively to the proteins that we commonly think of as foods. It has equal application to the microscopic proteid organisms. Thus bacteria are relatively harmless if they are so abundant that the organisms of our ancestors have dealt with them generation after generation;

contrariwise, they are classed as toxic if they are comparatively rare, so that the race has not developed a defensive mechanism against them. Note, by way of illustration, that measles is a mild disease in Europe and America, but becomes a very virulent one in Japan. The presumption is that the germ of measles did not come in contact with the ancestors of our race until a period subsequent to that in which the Japanese stock had branched from the western stock.

There is abundant evidence to show that any inherent habit of action once fixed on a living organism is a perpetual endowment, to be transmitted from one generation to another in perpetuity. So we may safely assume that when an organism has learned to deal with any given protein in such a way as to render it innocuous, the descendants of that organism will retain the capacity to repeat the process indefinitely. It follows that every higher organism can deal effectively—under proper conditions and in restricted quantities—with all the different types of proteins that have come in regular contact with its ancestors to the remotest generations.

Thus is explained the familiar fact that each higher organism can find nourishment in a great variety of foods; coupled with the fact that the blood plasma of the organism normally contains the antidotes for a considerable number of bacterial poisons.

Of course this higher organism has become a very complex mechanism, with many members, each specialized to perform a particular function. As regards this function of combatting the noxious forces of the environment, the digestive system is pre-eminent. But this system, in the broad view, is not so much an inherent part of the organism, as an outer wall of defense so placed as to make sure that in general no

unmodified proteins shall find their way through the mucous membrane fortifications. But the organism cannot depend absolutely on this defensive mechanism, as we have just seen; so it is necessary to have other defenders on guard inside the walls. And it seems on its face a plausible suggestion that the cell which retains most of the character of the primitive primordial protozoal ancestor, and which, so far as we can see, is not specialized to perform any other function, is the one which has retained pre-eminently this primordial capacity of harmonizing the organism with the living, or once living, elements of its environment.

Such a primitive cell is found in the leucocyte. No other cell in the body retains so fully the primitive characteristics of the protozoal ancestor. And, patrolling every where the blood stream which carries particles ingested from the outer world, the leucocyte is most favorably situated to come immediately into contact with intruding substances, and to take up with the least possible loss of time the work of so modifying them that they meet the needs of the organism.

The leucocyte looks like an ameba, and it is seen to ingest solid particles of food just as an ameba does. Can we doubt that its chemical processes of digestion are closely comparable to those of its prototype?

#### THE LEUCOCYTE AS A MICROCOSM.

At the first thought it might seem to strain probabilities to the breaking point to suggest that a cell of such proportions as the leucocyte could conceivably be the habitat of a series of chemical substances so complex and varied as is here implied. But a very brief consideration of the facts as to the size of molecules and atoms, as placed at our disposal by the modern physicist, dispels any such doubts.

It is known that the smallest particle visible under the microscope is about one fifty-thousandth of a centimeter in diameter. Cubing this number, we find that a cubic centimer will contain one hundred and twenty-five thousand billions of such particles. But the researches of Rutherford, who has somewhat accurately determined the size of the atom, show that a cubic centimeter of space may contain twenty billion times that number of helium atoms.

In other words, the smallest particle visible under the microscope is large enough to contain many times twenty billion atoms; inasmuch as the atoms computed by Rutherford were in the gaseous condition, and hence very much more widely separated than those in the solid particle under the microscope.

It appears, then, that if we were to assume that there are one thousand different antibodies developed in the organism—each one antagonistic to some specific type of protein—there is ample opportunity for such a collection of antibodies in the smallest particle of matter visible under the microscope, even if we assume that each one of these antibodies is made up of at least twenty million atoms. So even if the leucocyte were far smaller than it is (for of course it is by no means at the limit of microscopic visibility) its nucleus might be a very intricate structure indeed, chemically considered,—a chemical laboratory quite elaborate enough to generate all the different types of antibody that the system could conceivably require.

Each of these nascent antibodies, as lodged in the leucocyte, may be supposed to represent a specific protein, capable of taking to itself the right combination of atoms to increase in size and, under proper conditions, to multiply indefinitely, to meet

the needs imposed by the intrusion of a particular type of toxic protein. In the ordinary course of events, doubtless, only a comparatively small number of the different types of antibodies in the equipment of the leucocyte laboratory would be called upon to come into action at a given time. It might even happen that for long periods of time, even for generations, a particular type of nascent antibody that has been developed in the cell might not be called upon to meet and antagonize its specific antigen.

But what we know of the germ-cell, and of the possible quiescence of hereditary factors for successive generations, teaches us that it may readily be possible for the cell to carry forward during an indefinite period such unused increments of nascent antidotes; and yet to call them into action when the proper stimulus comes, even though such stimulus has not hitherto been applied for many human generations.

In this view, then, we may think of the cells that generate the leucocyte as a store house in which minute quantities of large numbers of different types of proteins are arranged, in what may be called the nascent state, all of them with potentialities of development, and a certain number of them constantly called upon to meet the stimulus of external conditions in the form of different types of protoplasms or proteids that, but for their aid, would be poisonous to the organism in the blood stream of which their daughter cells, the leucocyte, are liberated.

It is of course the mother cells, in bone marrow and spleen and lymph node, that must be thought of as the permanent source of supply of these nascent antibodies. For of course the developed leucocyte, once it has gone out from the parental abode, is in a sense an independent organism, lying beyond the bounds of the cellular system of

the complex organism in the blood stream of which it operates. The force of this view is very well illustrated in the familiar fact that when toxic bacteria are ingested by a phagocytic leucocyte, these toxic bacteria are no longer able to exert a malignant influence on the organism. For a time they retain their normal form and appearance; but the leucocyte, by engulfing the intruder, has given entire protection to its human host.

Let it be further recalled that this probably would not be true of any cells other than the leucocytes in the entire organism.

This fact, taken by itself, gives strong corroboration to the thought that the leucocyte is primarily and fundamentally a detached organism, acting in close alliance with the animal body, but being in a broad sense independent.

In this comprehensive view, then, we shall do well to get away from the notion of virulent bacteria, and to think of all the stages of assimilation and immunization as closely allied, and as applying to proteins in general. In practice we must recognize the virulence of certain types of bacteria; but we shall do well to understand this virulence as conditioned merely on the fact that the organism has come somewhat rarely in contact with these particular microbes. There are myriads of bacteria always in the organism and these for the most part are as innocuous as flecks of albumin, for the simple reason that they have been so long with us that they have become domesticated—that is to say the body-tissues have become immunized against them.

According to the Proteomorphic theory, as we have seen, such immunization has resulted in part from the activities of the leucocyte, through which the blood plasma has come to be constantly permeated with antidotal chemicals.

## ANTITOXINS AND NEW CHEMICAL PROBLEMS.

There are certain types of these antiodal chemicals, however, to which we have hitherto given scant attention. These are the so-called antitoxins which are developed in the blood not necessarily because of the presence of proteid bodies, but in response to toxins that are themselves the product of protoplasmic activity. No organism can grow and develop without giving out waste products that are poisonous to living protoplasm; and the bacterium is no exception to the rule. So when it finds access to the human system, it necessarily vitiates that system with its waste products.

We ordinarily think of these as toxic properties that are put out by the bacteria with the express design of injuring the human body. But such a view is altogether anthropomorphic and mistaken. The so-called toxins are merely either (1) waste products, or (2) enzymes put forth by the bacteria to aid its own digestive processes. But they may serve as virulent poisons to the tissues of their host nevertheless—which is highly unfortunate for the bacteria themselves, since death of their host will in many cases mean death for them also.

Of course the bacteria that are being digested by the leucocyte give out such toxic principles, and it is necessary in overcoming them to neutralize these toxins as well as to proteolize the body of the bacterium itself. In this case, we may suppose, the leucocyte adds antitoxins to its list of responsive enzymes, along with the antibodies directly aimed against the proteid bodies of the enemy. It is possible that opsonin is such an antitoxin.

But there are also cases in which the bacteria only lodge on some surface of the body—say the throat—and use the vascular

channels as a sort of sewer into which to discharge their waste products. The local injury may be very slight, the entire danger to the organism resulting from the presence of the excretory toxins, not to protein itself of any type. The colonization of the diphtheria bacillus furnishes a typical illustration in point.

In such a case, as is well known, the body may be able to produce chemicals that neutralize the toxins, thus saving the life of the human organism. Moreover these chemicals may be produced in such excess that the blood becomes more or less saturated with them, giving the organism immunity to similar attacks in the future, at least for a time. These neutralizing chemicals are known as antitoxins. They are not necessarily poisonous to the bacteria the toxin of which led to their development. The diphtheria bacillus, for example, will grow and thrive in a medium containing large quantities of diphtheria antitoxin.

Here, then, is a type of antibody that has not been developed directly through the parenteral presence of a protoplasmic body. And the question at once arises as to the source of this antitoxin. Is the leucocyte here as before the agent that guards the body from the insidious attack?

The attempt to answer this question has proved more puzzling, if possible, than the attempt to localize the mechanisms that antagonize and give immunity to the bodies of the bacteria themselves. Most workers in the field leave the question quite unanswered. It suffices for them that the antitoxin is produced somewhere in the body, and that it ultimately permeates the serum of the blood. But it is obvious that a satisfactory theory of immunity must give us a far more definite answer.

In the opinion of the present writers,

there are data at hand that enable one to answer the question with a fair degree of definiteness. It must be admitted, however, that these data do not include unequivocal and demonstrative experiments, such for example as the discovery of the antitoxin in some specific tissues before it appeared in the blood serum. We must be content with indirect evidence. This, however, is to say the least highly suggestive, and its findings are full of interest. In our opinion they justify the belief that the chief agents in the formation of antitoxins are the red blood corpuscles; their efforts being supplemented, however, on occasion, by the work of its leucocytes on one hand and by the various body tissues on the other.

The evidence is based very largely on experiments undertaken for a quite different purpose and having to do with the hydrolysis and synthesis of proteids. In particular the work of Emil Fischer and his pupils has given the clue, although hitherto, so far as we are aware, no one has attempted to interpret or follow it up.

To gain an inkling of the import of this work, in the present connection, we must very briefly summarize some of its important findings as to proteolysis. The most significant of these experiments, from the present standpoint, are those in which Abderhalden has tested the capacity of enzymes excerpted from different bodily tissues to hydrolyze various synthetic polypeptides. The polypeptides were so named by Fischer to indicate their relationship with peptones. It is believed that the peptones (as hydrolyzed from protein through the medium of proteoses) consist of a chemical aggregation of various polypeptides. Stated otherwise, the polypeptides would result from the cleavage of peptones; although in point of fact those experimented

with were synthesized in the laboratory by the combination of various amino-acids.

The simplest polypeptides (di-peptides) result from the union of two amino-acids; more complex ones from the combination of three or four or five amino-acids. The molecule of a polypeptid is therefore complex as compared with the molecule of an amino-acid; but, on the other hand, it is relatively simple as compared with the molecule of peptone. In other words, a molecule of peptone could be cleaved, perhaps by successive stages, to form a goodly number of molecules of the most complex polypeptides yet synthesized.

It is important to get clearly in mind this position of the polypeptides as nitrogenous compounds, which are considerable more complex than amino-acids, and yet very simple indeed as compared even with peptones, which in turn have but a fraction of the complexity of the original protein from which they are hydrolyzed. There are some thousands of atoms in a molecule of protein; some hundreds in a molecule of peptone; some scores in a molecule of the more complex polypeptides; and, as we have seen, less than two dozen in the molecule of an average amino-acid.

It is familiarly known that the giant protein molecule which comes into the stomach as the chief constituent of proteid foods is hydrolyzed and disintegrated to the peptone stage by the enzymes of the digestive tract. Just what happens to the peptone after it is absorbed into the intestinal wall has been a matter of dispute. There is no question that it is further metamorphosed, for it does not appear as peptone under normal conditions in the blood stream. The balance of authority lends strong support to the belief that the peptone is further hydrolyzed in the intestinal wall, until its mole-

cules reach or approximate a degree of smallness that makes them available for the use of the various body-cells to which they will presently be carried by the blood stream. It seems highly probable that they enter the blood as amino-acids, of various types, and are thus carried to the tissues as dispensers of building materials, among which each individual type of cell may select in accordance with its needs—for the different body proteins are made up of different combinations of amino-acids.

But we have seen in our earlier discussions that it happens on occasion that portions of the proteins taken into the stomach find their way through the intestinal wall unmodified, or not greatly modified, by the digestive ferments, and introduce a complication in the problem of assimilation; a complication which, according to our thesis, is met by the activities of the leucocyte. If the gigantic molecule of protein thus finds its way on occasion through the intestinal wall, it seems plausible to suppose that the comparatively small molecules of the polypeptid order must make similar entrance into the blood stream even more frequently. But if such is the case, we may fairly assume that means will be found there to effect further hydrolyses in the fluids of the body. And, in point of fact, experiments have shown that when certain polypeptides are artificially introduced into the blood stream of animals, they may fail to appear in the excretions, proving that they have been metamorphosed in the body. Abderhalden found that a considerable number of the polypeptides might thus be utilized by the organism of a dog.

Obviously, then, there may be developed within the body tissues or in the blood stream enzymes capable of hydrolyzing the polypeptid molecule—a molecule, be it un-

derstood, which the combined juices of the stomach and pancreas and duodenum, under ordinary circumstances, are unable completely to cleave or break down.

The interesting question arises as to what particular tissue or tissues of the body accomplish this remarkable feat.

Abderhalden set himself the task of experimentally answering this question. In conjunction with Peruuchi, Hunter, and Rona, he prepared extracts and juices of various organs, using Buchner's method of grinding up with sand and expressing the juices under a pressure of one hundred to three hundred atmospheres, by which method the cell enzymes are obtained. The tissues thus treated included the liver, the kidney, and the muscles of the rabbits and dogs; lenses from the eyes of pigs; the brain of the calf; blood serum of ox, rabbit, and dog; and blood corpuscles of various types. Different types of polypeptides were used, to test the selective affinities of the various enzymes.

It was found that the juices of each and all of the tissues just named (as also juices of germinating wheat, germinating lupine, the mushroom, and various moulds) contain enzymes that hydrolyze one or another of the polypeptides; each juice, as a rule, acting on several different types of polypeptides. Juices of liver, kidney, and muscle hydrolyzed the simpler polypeptides. The plasma and serum of the blood both hydrolyzed complex types of polypeptides, which are known not to be attacked by trypsin, proving that the blood fluids did not receive their enzymes by absorption from the intestinal tract.

But, in any event, it was needless to look far afield for the origin of the enzymes in the blood fluids, inasmuch as the juices expressed from the red blood corpuscles

proved capable of hydrolyzing the most complex polypeptides.

The leucocytes of a horse, on the other hand, failed to hydrolyze a polypeptid which the red blood corpuscles of the horse, and also the blood platelets, hydrolyzed actively.

It may fairly be concluded, then, that the hydrolyzing of polypeptides that find their way into the blood stream may be accomplished by enzymes secreted by various organs and tissues, including the muscles; that the red blood corpuscles are very active agents in this capacity, notably, perhaps, with regard to the most complex polypeptides; and that it does not fall within the range of the activities of the leucocyte to deal with these comparatively simple nitrogen compounds. The leucocyte, like the organs that produce the digestive ferment of the intestine, acts on the full-sized protein molecule, and begins its cleavage. But in the light of the new evidence, it may somewhat be doubted whether the leucocyte is able to carry on this cleavage to its final conclusion. It is at least possible that the protein molecules, multiplied by cleavage, acquired an osmotic pressure that causes the disruption of the leucocyte when the polypeptid stage of hydrolysis has been reached. If such is the case, the autolyzed leucocyte would discharge its contents in the midst of myriads of red blood corpuscles capable of taking up the work of hydrolysis where the leucocyte left it, and completing the cleavage of polypeptides into amino-acids.

According to the hypothesis already expounded, it would be only comparatively small quantities of foreign protein that would thus come under the auspices of the leucocyte; but it is not unlikely that considerable quantities of polypeptides may find

their way habitually into the blood stream; and it is to be recalled that the red corpuscles, marshalled in numbers a thousand times as great as the number of leucocytes, should be able to deal with the polypeptides in almost any quantity.

It is even conceivable that all the protein foodstuffs are absorbed in this state (since the evidence for their change into amino-acids in the intestinal wall is not quite conclusive), and normally undergo their final stages of hydrolysis under influence of the erythrocytic enzymes; the tissues of the liver and brain and muscle standing guard meantime in the background, as it were, ready to attack (each within the limits of its capacity) any portions of polypeptides that escape the militant army of red corpuscles. The numbers and aggregate bulk of the red corpuscles suggest their possible capacity to accomplish such a task.

These experiments, then, enable us to form a more complete and more satisfying mental picture of the processes of digestion and assimilation than has ever hitherto been possible. We shall be able to fill out certain gaps in the picture as we proceed, ultimately presenting at least a suggestive scheme of the entire cycle of protein metabolism in the body.

#### THE RED CORPUSCLE AS MASTER IMMUNIZER.

But where, it will naturally be asked, is the point of contact between this scheme of polypeptid digestion and the development of antitoxins?

The answer is this: The bacterial toxins that evoke the responsive antitoxins are products of protoplasmic activities; and they are known to be comparatively simple in chemical composition, their molecules being in all probability of the same order of

complexity as the molecules of polypeptids. It is a fair presumption that the bodily enzymes proved to act on the polypeptids are the ones that act also on these allied bacterial toxins.

If the inference is justified, the sources of the antitoxins are clearly revealed: They are the cells of the entire body, each type having a selective action of its own; and, in all probability, the red blood corpuscles being the ones that have the most general and the most comprehensive activities in this connection.

Now it is obvious that so bold an assumption as this requires all the support that can be found for it in analogical reasoning. Fortunately there are several lines of such reasoning that supply confirmatory evidence.

Thus, bearing in mind the nitrogenous character of the waste products of protoplasmic action in the animal organism (for example urea, with the formula  $C_2H_4N_2$ ), we are justified in assuming that the toxic principles given out by the virulent bacteria are not altogether dissimilar nitrogenous compounds. This assumption is strongly supported by the observed similarity of action of these toxins and sundry narcotic drugs of the familiar alkaloids. And these alkaloids have known chemical formulae that at once reveal their chemical relationship with the polypeptids.

Morphine, for example, is  $C_{17}H_{19}NO_3$ ; strychnine is  $C_{21}H_{22}N_2O_2$ ; and glycyl-glycine, the simplest of the polypeptides has the formula  $C_8H_{16}N_4O_6$ . If we knew how to combine the amino-acid called valine ( $C_5H_{11}NO_2$ ) with the amino-acid called leucine ( $C_6H_{13}NO_2$ ), we should have a molecule with the composition  $C_{11}H_{24}N_2O_4$ , in still closer simulation of the strychnine molecule. The com-

bination of two molecules of the amino-acid, glycine with one of leucine, which has been effected, gives the formula  $C_{17}H_{33}N_8O_7$ .

Of course we can by no means assume that because the combinations of atoms in a given pair of molecules are similar, the gross physiological effects of these molecules on the organism will be identical or even comparable. To disprove any such hypothesis, nothing more would be necessary than to consider the chemical composition of certain other alkaloids, for example quinine, which, with its formula  $C_{20}H_{24}N_2O_2$  seems to have close touch with strychnine; yet which, as every tyro in medicine knows, is very fundamentally different in its physiological action.

It should be understood, however, that in the modern view a drug acts on only those tissues with which it can enter into chemical union; and that the markedly different physiological actions of drugs depends upon the affinity for them shown by this or that type of cell in the tissues of the body. Quinine and strychnine appear to us radically different drugs, because their effects on the human system are so conspicuously diverse; yet their chemical composition proves their close similarity; and a reasonable explanation of the difference in their effect is given if we assume that the precise combination of "side-chains" in the strychnine molecule chances to fit in with the scheme of the molecules making up the substance of the central tissue of the brain; whereas the side-chains of the quinine will link it with other tissues that are in themselves no less profoundly affected than are the brain tissues by strychnine; but which are not so vitally and intimately associated with the life-processes of the organism as a whole.

It is in the fact that most alkaloids, in common with toxins, find their affinities in the cells of brain and spinal cord that the seeming toxicity of these substances lies. Many a "harmless" compound may affect muscle cells, let us say, far more profoundly than the brain cells are affected by morphine or strychnine, yet have no "toxic" effect because the muscles do not contain the centers of cardiac and respiratory control, as do the nervous centers.

Considered in this broad way, there is ample justification for the belief that the physiological activities of all drugs are intimately linked with their chemical composition; and that, in the sense just interpreted, drugs of closely similar chemical composition have strictly analogous effects.

But everything depends upon the particular tissue cell which chances to have affinity for any given drug; and the experiments of Abderhalden as already cited, showing the elective affinities of different tissues for polypeptides, may be considered as laboratory interpretation of familiar facts of clinical medicine. The fact that many alkaloids and such poisons as that of *B. tetanus*, and, indeed most of the bacterial toxins, give evidence of affecting the brain, dove-tails, at least presumptively, with the highly interesting experiments that show that two of the most complex of the polypeptides were hydrolyzed by the juices expressed from the brain cells of a calf.

It may be added that in the case of two less complex types of polypeptides, the juices of the calf-brain failed to act; and conceivably it is not stretching analogies too far if we observe that the alkaloids which are known to have a pronounced cerebral effect are considerably more complex, particularly as regards their carbon and hy-

drogen atoms, than the simpler (di-amino) polypeptides; and if we associate relative complexity of molecular structure in a drug with affinity for the cerebral tissue, in itself presumably the most complex of organic bodies.

#### SPECIFIC AFFINITIES AND ANTAGONISMS.

Closely in keeping with these rather abstruse theoretical considerations are the familiar and very practical experiments of Pasteur through which the anti-rabic virus was developed. Here, as is well known, the material used for making the protective inoculation is found in the spinal cord of a rabbit that has been successively inoculated with the virus of rabies.

Equally suggestive in their way were the experiments of Wassermann, who mixed tetanus toxin with the brain substance of a susceptible guinea pig, and found that the mixture was no longer toxic for other guinea pigs. This seemed to show a special affinity between the brain substance and the toxin, inasmuch as emulsions of other organs of the guinea pig when brought in contact with the tetanus toxin exerted no such effect. "It would appear from this experiment," says Nuttall, "that a toxin may have a special affinity for special tissue cells, and this appears to explain the neuro-toxic character of the symptoms which are observed in tetanus."

It would be better, perhaps, to say that certain cells have an elective affinity for the toxin, rather than to make the converse statement; best of all to think of the attractions as mutual. In chemical terminology, some cells have side-chain groups of molecules for which the molecules of the toxin can readily be substituted; or with which they may be combined through a new arrangement of the atoms. What deter-

mines these affinities, we shall not know until we are better informed as to the ultimate nature of chemical valences in general; but for the present purposes it suffices to note the seeming demonstration that such elective affinities exist, and that they are exercised by various tissue cells of the body in connection with an endless variety of nitrogen compounds.

Another very striking illustration of such elective affinities, in this case involving the muscle cells of the unstriped muscles, is furnished by the amino-acid-like product, known as adrenalin.

The origin of this product in the suprarenal glands, and its extraordinary effect in constricting arterioles, are familiar to the profession. But it may not be so generally known that adrenalin differs by only two hydrogen atoms in chemical composition from one of the familiar amino-acids named tyrosine. Such, however, is the fact, the formula of tyrosine being  $C_9 N_{11} NO_3$ , and that of adrenalin  $C_9 H_{13} NO_3$ . That adrenalin exercises its constructive function by directly influencing the muscle fibers of the arterioles is shown by the continuance of its characteristic action when applied locally after severance of the nerves leading to the tissue under treatment. Let it be observed, too, that it is the cells of the unstriped muscles alone that seize on the adrenalin molecule; the cells of other muscles seeming to let it pass unnoticed.

When we add that adrenalin exists normally in the blood only to the proportion of one part in a million, yet that its presence in this infinitesimal quantity seems necessary to the very life of the organism, light is thrown from yet another direction on the intricate coordinations of the animal machine as effected with the aid of the nitrogen-bearing molecule.

Here is a substance which, were we able

to remove but two of its hydrogen atoms, would become merely a commonplace member of the group of amino-acids, ready to be taken up by this, that, or the other tissues of the body, as a component part of its protein; and yet, in virtue of the presence of those two supernumerary hydrogen atoms, it gains special affinity for cells of a particular type, and causes those cells, in recombining their structural materials, to undergo a destructive metabolism of an almost explosive type which finds tangible expression in a muscular contraction.

Could we look into the structure of the muscle cells during this time of its explosive activity, with vision more ultramicroscopic than is afforded by any instrument yet devised, we should see that the cell, in readjusting its molecules, has some left-over materials, like the shavings and sawdust of a carpenter, that are not needed in the new combinations; and that these left-over products are excreted into the surrounding fluid medium. And what is true of the muscle cell under these circumstances is equally true of every other muscle cell whenever it contracts from whatever cause, and of the cells of every other bodily tissue when they undergo characteristic activities. Changes in the molecular structure of the cell—incident to or underlying all activity—are affected only at the expense of potential energy, and with actual gain or loss of physical material. Destructive metamorphoses, which attend the active functioning of all tissues, are attended by a loss of substance. And it is almost axiomatic to say that the precise character of the substance given out as a waste product or a by-product must be dependent on the character of the substance available to replace it. On occasion there comes to hand, let us say, a group of atoms that is admirably suited to fit into

the structure of the molecule of the cell, provided that another group similar in character but on the whole somewhat less satisfactory is excluded. So the substitution is made, and the discarded group of atoms flows away in the blood stream.

It is obvious that groups of atoms that can thus be substituted one for the other may bear to each other a certain complementary relation. It is one way of expressing this relation to say that the intruding molecule is an antigen, and that the extruded one is an antibody. In view of the mutual relations of these structures, it does not seem strange that members of the two clans, when they chance to meet in the blood stream, can enter into mutual combinations. Two groups of atoms each of which can unite with a third group may very well unite with each other. But when the antigen has thus combined with an antibody, it no longer has free valences, and so it cannot combine with the cell that it formerly would have entered. In the event that the particular antigen in question was the kind of protoplasmic product that we call a toxin, we may well enough call the antibody an antitoxin; and we may speak of the union of the two as neutralizing the poison and rendering it harmless. But this of course applies only to exceptional instances in which the antigen had properties that made its presence objectionable in the cell with which it has affinity. Most antigens that would ordinarily be found in the body have not such harmful properties, and their antibodies, although acting in the same way, would not serve the same purpose.

But at the moment, of course, we have specifically in mind the antigens that are toxic; and their specific antibodies are the antitoxins. And the purport of the present phase of the discussion is, it will be re-

called, to make it seem plausible, on various analogical grounds, that each and every living cell of the body must on occasion take to itself what we may call antigens, and give out what we may call antibodies; and that the particular tissues that can produce antibodies in response to any given toxins are precisely those tissues that are receptive to the invasion of that toxin.

If the toxin be one for which the brain tissues have pre-eminent affinity, the antitoxin produced will come from the brain cells. If the toxin be one attacking the liver, the liver cells will furnish the antitoxin.

However specialized any cell may be to perform pre-eminently a particular function through division of labor in the entire body every cell must retain the primitive capacity to take in nourishment and give out excrementitious products, else it obviously could not maintain existence. And it is conceived that the production of an antitoxin in response to a toxin that the cell can absorb is merely a special manifestation of this primal and fundamental function.

The bacterial toxins are, according to the present hypothesis, relatively simple nitrogen compounds of a type suitable for combination with various of the body cells; the production of complementary bodies or antitoxins by these body cells, under these conditions, may be said to be a commonplace of physiological activity—though sharing, of course, in the inscrutability that attaches to all chemical processes.

#### LOSS AND GAIN THROUGH THE DIVISION OF LABOR.

But the reader who would clearly apprehend the bearings of the theory of immunity that we are attempting to expound must

on no account fail to note the exact terms of this definition just given. The antitoxins, in this view are produced by various and sundry of the body-cells because these antibodies are evoked in response to the coming of toxins that are relatively simple nitrogenous compounds. When, however, the antigen that comes is not a by-product of protoplasmic activity but the protoplasm itself as evidenced in the body of a bacterium or in molecules of unbroken protein in any form, the case is quite altered, because the body-cells in general are not adapted to absorb such materials. Their location in the body, shielded by encompassing walls of skin and mucous membrane puts them out of contact with such crude raw materials, the transformation of which has been turned over to an especially adapted apparatus known as the digestive system.

Each cell must retain the capacity to take food; but it may have lost the capacity to imbibe this food in a crude or undigested form.

Such is indeed the condition of the specialized cells of the brain and muscles and of the parenteral organs in general. The penalty of their specialization is that each of them, while gaining in one feature, has lost in various others. The single speck of protoplasm that constituted the entire structure of the primordial protozoal ancestor was at once stomach and muscular system and circulatory apparatus and brain. But in the developed organism, each individual cell retains only the faint reminiscence of each type of function except the one for which it has been especially developed; and this one it can carry out in exaggerated fashion. The particular cells that have made themselves masters of that department of the work which has to do with

the ingestion of food and the splitting up of proteins is called the digestive apparatus; and its work is supplemented, we have found reason to believe, by the leucocytes.

But when, as occasionally happens through inadvertence, a considerable quantity of protein in the unbroken form makes its way into the circulation and comes thus in contact with the body-cells in general, it is as useless to these cells as if it were composed of utterly unassimilable materials.

The proof of this is that proteins thus introduced in quantity are excreted unchanged through the kidneys. The leucocytes, to be sure, deal with part of this foreign protein; but their capacity is limited, and beyond that nothing remains but to eliminate the foreign substance as rapidly as possible. In case this cannot be accomplished, the protein which might, under other conditions, be invaluable as food for the tissues becomes a menace through a mechanical clogging of the spaces about the cells, and perhaps through the accumulation of partially metamorphosed product as the result on the activity of the leucocyte. Antibodies quite different from antitoxins will be developed by the leucocytes; but of course these can avail only if the foreign proteins come in relatively limited quantity.

So much by way of recapitulation, and to make clear the distinction that we conceive to exist between the sources and the character of the antibodies as evoked by antigens that on one hand are protein bodies and on the other are the metamorphosed products of protoplasmic activity—so-called toxins.

#### THE COALITION BETWEEN RED CORPUSCLES AND WHITE.

Reverting now to the latter, in continuance of the theme, it remains only to point out that, whereas it is conceived that all

the cells of all the tissues of the body have capacity for the production of antitoxins in response to small moleculed toxins, it would appear that there is one type of cell that is pre-eminently adapted, in virtue of its location in the organism, to absorb these toxins and render them innocuous; at the same time, of course, giving out the residual products which we term antitoxins. The cells in question are the red corpuscles of the blood.

A very prominent function of these cells, according to the present thesis, is thus to shield the body-cells in general against the attacks of the numerous toxins that necessarily, under existing conditions, find their way more or less continuously into the blood stream. In particular, to shield the brain cells, because they take (in Abderhalden's experiments) the same type of complex nitrogen compounds that have affinity for the cerebral tissues. Ordinarily the red corpuscles come in contact with them first, and thus the brain is protected.

As justification for the conclusion, we have the entire line of analogical reasoning just presented, supported specifically by the experiments of Abderhalden which showed, it will be recalled, that the red blood corpuscles manifested exceptional activity in the proteolysis of those polypeptides which we have all along likened to the toxins.

Of course the specific antitoxins developed by the red blood corpuscles would, in the nature of things, be liberated into the blood plasma. But there would doubtless be a good many compounds formed that could not advantageously be thus disposed of; and possibly it is to meet the complications thus introduced that the body has developed the custom of destroying vast quantities of the red blood corpuscles constantly in the liver, where the refuse matter they

contain may be promptly eliminated in the form of bile. It may be doubted whether any other hypothesis hitherto presented more plausibly accounts for the constant destruction of red blood corpuscles, which, as first blush, seems to set at defiance the usual bodily custom of conserving materials.

In this view, then, the red blood corpuscles have an immunizing function strictly complementary to that of the white blood corpuscles, and no less important. One legion of cells cooperates with the other, each having its own special field. The white corpuscle deals with all formed bodies and full-sized protein molecules of foreign type that make their way into the blood stream. The red blood corpuscle deals with the later cleavage products of protoplasmic activity. In carrying out their respective tasks, the leucocyte supplements the work of the ferments of the digestive tract; the red corpuscle supplements the work of the leucocyte and relieves the ultimate tissues in considerable measure of the task of protecting themselves against small-moleculed nitrogen products that might prove harmful.

Interpreting the work in the words of the bacteriologist and pathologist, we may say that the leucocyte, in the pursuance of its general scavenging function, produces "complement" that is a digestive ferment somewhat of the order of trypsin; and "antibodies" of the types known as bactericides, bacteriolysins, opsonins, and precipitins; also antitoxins to neutralize the offensive or defensive toxins put forth by the living bacterium. Meantime the red blood corpuscles, aided and supported on occasion by various and sundry of the specialized tissues—liver, kidney, muscle, brain—produce complements of a different

order from those produced by the leucocyte, capable of dealing only with partially hydrolyzed protein products; and produce also specific antitoxins that chemically neutralize bacterial toxins and in particular the final by-products of bacterial decompounding, but do not attack the bacteria themselves. It is not unlikely that hemolysis also fell within the scope of the erythrocytic activities.

If the implications of the theory are clearly grasped, it will be obvious that, according to the present view, there is no fundamental distinction between the various "complements" and "antibodies" thus defined. The word "complement" as commonly used merely serves to define such members of an endless series of ferments as are relatively susceptible to the influence of high temperatures. The line of demarcation thus established has obvious practical value; but we should not be led thereby to imagine a duality of action which in all probability does not exist in fact.

What we term "complement" in any given case is the ferment or combination of ferments regularly developed in quantity by the cell in question to meet the more or less habitual needs incident to the ingestion of proteins of its environment. What we term an "antibody" in any given case is one of a series of ferments developed in response to a specific impulse given by an individual type of protein or protein product. The trypsin of the leucocyte would stand at one end of that scale; the antitoxins of the red corpuscle at the other; but there would be intermediate forms to cover all the field between the two, each enzyme doubtless overlapping more or less with its neighbors.

That the general ferments or complements should be themolabile and the anti-

bodies relatively thermostable may conceivably be due to the greater complexity of the former, consistent with their more generalized function. But that there is any radical and fundamental distinction in the nature of the two types of structures seems theoretically improbable.

The demonstration or refutation of the validity of this assumption, however, is a matter for the chemistry of the future, with its extended knowledge of the nature of enzymes in general.

(To be concluded in November issue).

## INSOMNIA AND SUICIDE.

BY

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For a long time past the frequent reports in the "*Yorkshire Post*" of suicide, associated with insomnia, have attracted my attention, and recently, under the heading, "Insomnia and Suicide," two cases were reported in that paper, the one a man, aged 51, the other a woman, aged 41. The inference is that if all the cases, in all the papers, were collected we should find that there is annually a very great wastage of human life from this cause alone going on, and I venture to say that this loss of life might be to a great extent prevented. But we must also bear in mind the thousands of sufferers from insomnia who struggle on, and who do not yield to the temptation to end a miserable existence.

What is being done by the medical profession in the way of prevention? Can I, individually help in any way? I have turned to the report of the meeting of the

British Medical Association at Brighton in July last, and find insomnia the subject of discussion in the section of neurology. The opening address, by Sir George Savage, seems to suggest his dissatisfaction with the present knowledge of, and treatment of, insomnia, for he closes his remarks with the words: "Recognizing the emptiness of my paper, I leave it for you to fill up." He was followed by Dr. Butter Stoddard, and the discussion was carried on by Drs. Constance Long (London), Robert Jones (Claybury), James Jamieson (Melbourne), Thomas Johnston (Hove), Herbert Shore (London), M. D. Eder (London), Professor Anderson (Galway), Drs. T. A. Williams (Washington), and Crichton Miller (London). The various kinds of treatment suggested and discussed were: sedatives and hypnotic drugs, travel and change of scene and surroundings, alcohol in some instances, hydrotherapy, hypnotism and suggestion; and words of warning were also used as to the dangers of some of these methods of treatment: for instance, the acquirement of the drug habit, and alcoholism.

I could find no mention, even, of error of refraction, and yet, as a result of a long experience, I firmly believe this to be the most constant and most powerful predisposing cause of insomnia; and the careful and skilful correction of it the most reliable weapon we possess in overcoming this malady. No danger attends it, and it does not interfere with any other treatment, should such be required.

Of course, in common with other observers, I fully appreciate the action of exciting causes, such as influenza, shock, worry, prolonged nursing, financial stress, etc., but feel that these by themselves would not be so harmful were it not that

the nervous system had been previously severely taxed by the constant strain induced by slight refractive error. My object is to emphasize the importance of this method of treatment, and to bring it home to those physicians and general practitioners to whom the sufferers apply for relief, and especially to those who have not hitherto relied much upon the ophthalmic surgeon for help in these cases. To do this, I think it will be of more practical utility to relate some of my experiences, egotistical though it be, and illustrate some of the points by cases which have occurred in my own practice, rather than to rake up isolated cases that have been published, or to refer to the many papers which have from time to time appeared. Moreover, anything that has been published will probably have already been read and digested by those who pay me the compliment of wading through this paper.

For more than twenty years my attention has been specially devoted to the consideration of the influence that slight refractive errors have in causing many of the functional nerve troubles, so prevalent in these days, and amongst these insomnia has naturally had a prominent place, and I hope to show of what great assistance a skilled and experienced ophthalmic surgeon may be to the physician in the treatment of this distressing affection.

In my student days we were taught that slight errors of refraction, anything below one dioptr, were of no consequence, and might be ignored. This was true, from a purely visual point of view, but as time went on it has been observed that these slight errors, although not causing any visual defect, are of great importance, in that they give rise to sundry neuroses. For a long time, and even now, the view that the

correction of slight refractive errors might be a cure for many functional nerve troubles has been scoffed at and ridiculed, but undoubtedly a change is gradually taking place in this respect. Especially should these slight degrees never be ignored in any case of insomnia, and I think it will be found that some error is nearly always present in those cases, not associated with organic disease, such as tumor, kidney troubles, and the like, or persistent pain from any cause. Insomnia is not usually the only symptom, but is generally associated with attacks of great depression, and often with giddiness or headaches.

It would be of no avail to quote a number of cases of suicide which I have reported in connection with this subject, for there must be few medical men who have not been more or less brought in contact with such cases, and none have not frequently read of them.

I should, like, however, to mention just two cases associated with refractive error which made a great impression on me at the time. The first was a gentleman who, for some years, had suffered from attacks of severe headache and depression, whom I saw on two occasions, with an interval of five years. Each time I urged him to wear glasses constantly, but, in spite of my appeals to his reason and common sense, he persistently refused to wear them except for reading. Some years later his self-inflicted death was reported, and he had left a letter in which was the passage: "I have fought my nerves for years, but can do so no longer."

Some years ago a pretty little girl of 13 years came to me with her mother, for whom I had prescribed glasses. Very slight drooping of one eyelid, together with a highly-strung nervous and shy manner,

suggested to me that she had inherited her mother's defect—astigmatism—and, on examination, found that it was so, and advised glasses. In this case, too, the mother refused to have "such a child" put into spectacles. I pointed out the possible ill effects which might arise, and asked her to think it over carefully, and let me know her decision. Unfortunately, she decided against my suggestion. When about 19 or 20 years of age, the daughter developed symptoms of neurasthenia, and for four years was treated by various methods until finally a "rest cure" was proposed, and she was taken to a nursing home for this purpose; and a few days later, in the absence of the nurse, she had destroyed that young life, out of which all brightness and joy had gone.

I will now turn to the brighter side of my paper, and give a few illustrations of what can be done for the relief of insomnia and also some of the difficulties that have to be surmounted, one of these being the scepticism of the patient as to the possibility of glasses being of use for such a purpose especially if the sight is good, or an oculist has already been seen.

The writer of the following letter was with difficulty persuaded by her doctor to consult me, for she could not believe that her eyes were responsible for the insomnia from which she had been so long a sufferer, as she had seen an oculist, and her glasses were quite satisfactory, so far as she knew, and she could see quite well with them. Fortunately for her, the doctor insisted, and she came. I modified her reading glasses, and ordered some for constant use. Three months later she wrote:—"I am sleeping wonderfully better since you saw me in May."

The following was a case of very long

standing, but I never despair of relieving any case of insomnia, if the patient will carry out my instructions to the letter. He writes:—"When you stated so confidently that you could cure my insomnia and depression, I could not believe it, for I had suffered from these attacks for more than twenty years. They came on at intervals, and lasted for several weeks, and had increased in severity in recent years. While they lasted I felt incapable of transacting any business satisfactorily, *and life did not seem worth living.* Since adopting your remedy, I have been perfectly free from any symptoms of this trouble."

A clergyman had suffered for nearly two years from spells of insomnia, accompanied by frequent attacks of palpitation, and a great feeling of "nervousness." The doctor who sent him to me diagnosed these conditions as due to eye-strain, which proved to be the case, although he would have passed the visual test as "practically normal." He reported subsequently: "The effect of the glasses has been decidedly good. 1. The palpitation has passed away. 2. The nerves are quieter, and normal sleep has returned. You have a most grateful patient, I assure you."

What a number of our own professional brethren have perished as the result of insomnia and nervous breakdown, and the verdict has been suicide, or, more mercifully, "misadventure."

I have seen many who have been very near such an end, and patients have often told me afterwards how greatly they had been tempted.

I remember very vividly the case of a comparatively young doctor, about 38 years of age; and his professional brother, who was attending him, came to talk over the details before sending him to me, and ex-

pressed his anxiety as to suicide or insanity. He had been taking drugs for his insomnia for some time, and his depression was extreme. It can well be imagined with what pleasure I read the letter which came from him about six months later. I may say that he had had glasses previously to my seeing him, but had not experienced much need of them, and had used them very little. He writes: "I am at present doing double duty, as my colleague is away through illness, so you may guess I am feeling very fit, to be able to cope with this difficulty. I am glad to tell you that the giddiness, insomnia, and other nervous symptoms have all disappeared, and I am now feeling bright and energetic; in fact, as well as I ever felt in my life. Of course, I wear religiously the glasses you ordered for me. Do you remember how I complained of most acute nausea and heart distress when travelling by rail? Well, that has also completely gone. I shall always feel grateful to you for what your skilled advice and sympathetic treatment have done for me, and I can conscientiously say that I can attribute my improvement to nothing else."

By treating what I look upon as the initial cause of insomnia, or nervous breakdown, we are able to anticipate more permanent results than are usually obtained from the use of drugs and other forms of treatment, which are in many cases only palliative and temporary in their effects. This point is well illustrated in a case reported in a former paper of mine published in the *Lancet* nine years ago on "Slight Errors of Refraction and their Influence on the Nervous System," (*Lancet*, March, 1905), and which I will briefly refer to again. The patient, a minister, had suffered for two years from severe head-

aches, insomnia and giddiness, resulting finally in a complete nervous breakdown. He had given up all hope of ever being any better, and he told me later that he dared not sleep in an upstairs room, and had given up shaving, as he was afraid he might yield to the temptation to commit suicide. The doctor had the usual difficulty in getting him to come to me, as he had seen an oculist in London, and had glasses, with which he could see quite well. I changed his glasses for reading, and gave glasses for constant use, and he wrote me six months later: "After ten weeks of hard and anxious work I am still holding my own. Refreshing sleep has become habitual after a long period of insomnia, during which I was quite a wreck, as you know, and, with sleep, strength began to return, and life, which had been a burden, is now a delight." This patient has been to see me recently, and tells me he has been actively engaged in his work since his visits to me in 1903.

Another very interesting case occurred in my practice a few years ago, but in this instance giddiness was a more pronounced symptom than insomnia. A lady had suffered from severe attacks of giddiness for several years, so giddy that she was afraid to go out of doors unattended, frequently had to leave the breakfast table, and, if she went to church, invariably had to come out. She had sought advice from many physicians in Belfast, Dublin and London, but without relief, and ultimately came to Harrogate. She was somewhat taken aback when the doctor whom she consulted here after a careful examination, and a patient hearing of her history, advised her to consult me. She at once said she had already seen the first oculists of the day, and quoted the names of six whom she had con-

sulted. Probably most doctors would have accepted that statement as final, and given up all idea of further treatment in that direction. Fortunately for the patient, that did not happen, and I saw her. I gave her glasses, both for distance and reading, and she soon began to improve, and wrote me 12 months later: "You will be pleased to hear that I have had practically no vertigo, have had no prolonged attacks since with you last July, and even the swift little turns have not troubled me now for some months. I never have to leave the table, and, indeed, may say that I am practically free, as I go on the roads freely, and never feel distressed, so if that only continues I shall be the happy woman I am at present."

Does this case not show that it is absolutely necessary, firstly, that the physician shall be aware of slight refraction errors as an initial cause of insomnia, and, secondly, that the ophthalmic surgeon to whom he may send the patient should also be aware of it, and should possess the combination of care, perseverance and skill necessary for the detection of very slight errors, accuracy in estimating the amount of such error, and tact and judgment in getting his treatment effectually carried out. Failure resulted up to a certain point from a lack of this combination., but in the end complete success was achieved by the confident persistence of her Harrogate doctor, together with the pair of spectacles she obtained in consequence of it.

The writing of my paper was at this point interrupted, and in the short interval of 24 hours before resuming it, rather striking coincidences have taken place. In the first place, in my daily paper another of those painful suicides is related, the rector of a parish having written a letter, which

follows, was found dead in a pool, with a bullet wound in the head: "Another sleepless night, no real sleep for weeks. Oh, my poor brain, I cannot bear the lengthy, dark hours of the night; dazed, confused, I know not what I am doing. God have mercy on me, and raise up friends to my poor wife." Do not these cases cry out to us for more strenuous efforts?

As illustrating the prevalence of it, three patients have in that short time sought my advice for insomnia, one from Ipswich, one from Dublin, and one from my own town, Harrogate. The latter, after trying various methods of treatment for nearly two years, tells me that it has at last been suggested by a specialist in London that his eyes might be the cause of his trouble; and that undoubtedly is the case. Truly, a prophet has no honor in his own country!

Thus far I have given a few illustrations of cases of long standing and of severe type, and if it is possible to give complete relief in such, does it not hold out great hopes for the future? Is it not also an inducement to those who have hitherto been skeptical to test the matter thoroughly for themselves, and gradually to acquire that experience which is so necessary for the surmounting of those many difficulties one meets in obtaining satisfactory results?

The natural inference, too, is that if these patients were seen in the early stage, there would be a ready response to treatment; and, if so, what a contrast financially alone to those of limited means: a pair of spectacles versus a sea voyage, 3 or 4 months in Switzerland or elsewhere, 6 or 7 weeks in a home for so-called "rest-cure," etc., etc.!

A few letters will suffice to demonstrate this ready response. A doctor who was

seriously near a nervous break-down was enabled to continue his work, he wrote: "I have persevered continuously with the glasses you prescribed for me in May last, with the greatest satisfaction. There is distinct improvement in the tone of my general health, and the depression, irritability and insomnia are relegated to the memories of the past. I could not have anticipated such good results, and tender my sincerest thanks."

The following is a case of nervous breakdown from insomnia and dyspepsia, and occurred in India. The patient was sent home to consult a certain physician in London, and ultimately came, for a course of treatment, to Harrogate. After being here six weeks, he was in despair, as he had derived no benefit. A friend of his then suggested that he should see me. He was much surprised, as he had particularly good vision, but came nevertheless, and the constant use of glasses soon helped him. He wrote from India: "It is now nearly six months since I was fortunate enough to come under your care, and I am writing to let you know how I have fared. From the time I started to wear my glasses, I began to feel an improvement in my general health, so much so that before I left home in December last I was feeling much better in every respect; and since my arrival in India I have continued to mend, until now I feel more or less like my former normal self. In fact, an altogether different man, both eating and sleeping well, whilst my indigestion is almost a thing of the past."

A similar case—a doctor of music writes: "I am glad to tell you I am in really good health again. I sleep well, and my nervous system is stronger than it has been for a long time. All my work, both public and

private, has been quite satisfactory, and I can now enjoy life."

To go on relating similar cases, as I might do, would be wearisome and monotonous, and space does not admit of it.

It has been my endeavor to give as simply and briefly as possible facts in connection with a few of the cases which have been under my observation, without the introduction of contentious matter or much theory.

But, before closing this paper, may I venture on just one suggestion as to the great prevalence of functional nerve troubles and the cause thereof?

I have often heard two special causes mentioned, "The strenuous life of the present day," and "The influence of heredity." With both of these I cordially agree, if I may supplement them thus:

"The influence of the strenuous life upon those whose nervous systems have been already considerably taxed by the presence of refractive error." Do we not see many men leading the most strenuous lives possible, and yet whose nervous systems never falter, and, on the other hand, those whose nerves are shattered, but whose lives have been anything but strenuous?

That the influence of heredity is shown in that the *initial cause* of the neuroses—*refractive error*—in one generation is so frequently *transmitted*, and gives rise to similar neuroses in the next. Do we not have instances of two brothers, or two sisters, the one with a normal, evenly-balanced nervous system and normal refraction—the other with *inherited refractive error*, and the highly-strung *neurotic* temperament?

It is my firm conviction that it is from the more general recognition, both by physicians and ophthalmic surgeons, of what

I have indicated as the initial or predisposing cause, and the earlier and more effectual treatment of it, that we must hope for a diminution of this appalling number of suicides, and that relief and happiness may be brought to that vast number, who, victims of insomnia and neurasthenia, or "nervous break-down," are dragging along a miserable existence.

"Kitchdon," Harrogate.

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## BALKAN BATTLEFIELD WOUNDS' MARVELOUS HEALING.

BY

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During our Civil War, and for long after, a bullet wound was subjected to search, sometimes successfully, usually not. Infection generally followed, and in the light of modern surgery, it's a marvel that recovery ever took place.

Today, should surgical interference be demanded, the X-ray locates the foreign body, and all things being equal, it is extracted.

The Balkan army surgeons many times permitted the bullets to heal up in the wounded, especially in cases where simple penetration and no destruction of bone or tendon accompanied the infliction of the injury. Every soldier in modern armies is supplied with a first aid packet, consisting of two compresses, safety pin, and roller bandage, all previously soaked in bichloride of mercury.

The high velocity of the Mauser and Mannlicher rifles usually produces a clean, perforating, aseptic wound. When this bullet strikes a bone, it either tunnels it or splinters its substance. Some of the

paths traversed by these bullets without proving fatal seem beyond belief. One Bulgarian Infantry man displayed the entrance hole in the chest over the heart, and the hole of exit in the back behind the heart region, yet the heart remained unharmed and went on performing its function. The projectile was deflected in some manner after entering the chest, and simply ran around the inner chest wall until a region of least resistance presented itself and then made its exit.

In two military hospitals we learn of twenty-three penetrating wounds of chest and only one subjected to surgical interference.

From the accumulation of battlefield data we find that men wounded with small calibre bullets recovered quite well from their wounds, even when the foreign body was permitted to heal up in them, provided of course, they had been dressed antisep-tically soon after being struck. That the surgeons on or near the firing line first swabbed out these wounds with tincture of iodine and then applied the first aid dressing is substantiated by reports of medical officers in the field.

Again, many wounded men walked unaided to the emergency hospital with practically no dressing at all, and got well, while those who had applied the packet recovered excellently and were often back under arms in a short time.

To the military surgeon who is acquainted with real war, this is not paradoxical. Men living in the open, and victorious in almost every battle as the Christian armies were in the Balkans, do not suffer such mortality when wounded, provided the medical corps is efficient.

It must not be inferred that when a bullet has ploughed up the tissues for some

distance and fragments of shells have carried bits of clothing and hair into the deeper parts, that only first aid is given. Here, as in all cases of mixed infection, surgical interference is demanded. In these cases the men were transferred to a base hospital and not operated upon immediately after their arrival, this delay abating danger of shock.

Dr. Van Ommersen of the Dutch Ambulance Service, tells us that many of these cases have been operated upon in almost a bath of pus, but when cleansed and their dressings changed regularly, and other sources of infection opened and drained, they rapidly recovered. That the regular trained nurse is essentially a part of military surgery today, is exemplified by the Balkan Medical Corps' lack of them. Voluntary nurses, willing but untrained, were numerous; ten out of one hundred and seventy were of real value.

The severest wounds were caused by artillery fire; 25% of the wounds of the extremities caused by shell fragments. Schrapnel balls caused terrible destruction of external skin, muscles torn beyond repair and bone pulpified. Those wounds became infected, but excellent results prevailed in many cases.

Several surgeons report on allied side 2,400 injuries, 13 fatal. About 18% of the small calibre bullet wounds healed kindly; 26% of artillery wounds became infected. When serving the guns, men were many times within 20 to 30 yards of the enemies' exploding shells. These fellows were not killed, but due to concussion, knocked down, stunned by the terrible impact in the near air, and remained deaf and dumb for several days.

It is amusing to hear the German, Austrian and Balkan surgeons admonishing all

military surgeons not to remove the first aid dressing. As if we Americans did not know that!

The late Dr. Nicholas Senn of Chicago, after the Spanish War, pronounced this surgical law. "The fate of the wounded rests in the hands of the one who applies the first dressing, dressings not to be touched unless symptoms demand it. Every change in dressing, more especially in military practice, is attended by risk of infection, and must be scrupulously avoided, unless symptoms develop demanding surgical intervention."

The use of tincture of iodine in open wounds has long been the practice in some clinics of great American surgeons and is nothing new. Among these may be mentioned Dr. Robert T. Morris, Dr. Joseph A. Blake, and Dr. George E. Brewer, all of New York, Dr. John Chalmers Da Costa of the Jefferson School of Philadelphia, and a host too numerous to mention. American surgery is abreast of the times; no well informed man can deny it. We have verified clinical experience by the Balkan war, but have learned very little that is new.

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## SCIENTIFIC STUDY OF METHOD AND PRACTICE IN EDUCATION.

BY

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The professions of medicine and education are each concerned in aiding a full and healthy growth and development of the body and brain of children, and evolving full mental and physical powers for employment in adult life. The child may be

observed and studied as a natural object that we can see and describe in repose, or in action, as much as any other living thing. I urge the scientific method—the methods of physical science and physiology, in addition to the meta-physical study of mind and mental processes. The two methods differ; the meta-physician proceeding to deal with complex questions records complex results (mental states) of complex causes; the physiological observer records what he sees, specially motor actions as indicative mental states, noting their antecedents and sequence.

In a clinical examination the doctor observes the body of the child and various organs; from the consideration of the physical signs recorded he forms his opinion of the present condition, and a prognosis, giving directions as to treatment.<sup>1</sup>

In studying brain action we specially note and describe all movements which are the signs of action in the nerve-centers whose function and inaction we wish to understand. This study of motor signs is specially important when we wish to observe mental status for the purpose of removing nasal and mental faults and defects, e. g. fidgetiness, inattention; forgetfulness—by training and education. It should be remembered that all mental action is expressed by movements and results of movement, whether in gesture, action, facial expression, speech or writing; without movement there can be no mental expression. Hence the study of movements affords a basis of scientific study of mental action, and the means of treatment of neuroses (e. g. stammering, inaccuracy and mental confusion) and mental backwardness by training.

<sup>1</sup> "The Study of Children and Their School Training." By the author; published by the Macmillan Co., N. Y., and Macmillan & Co., London, Chapter IV. Digitized by Google

On going into a schoolroom to study<sup>1</sup> the children, I like first to observe each child at work. Then request the pupils to stand in line and "hold hands out straight," note the postures of the body, head, hands and fingers and the face; normal or sub-normal signs in each part have a value which has to some extent been determined by extended observation; each defective action is a point that may be indicated to the teacher whose business it should be to rectify them in detail; we can at least suggest something to be done in training.

I have not space to indicate here the special move-signs that may be noted; it must suffice to take a few examples.<sup>2</sup>

The hand balance may be weak: instead of a slight posture with all the fingers and palm in the same position, the wrist is dropped, the palm contracted together, and the fingers slightly bent. Among 50,000 children I examined in schools this sign was present in 715 boys, 504 girls, of those the teachers reported 40.0% of the boys and 35.3% of the girls as dull pupils. As an item in training, free-hand exercises might produce a straight balance, and more energetic brain action.

When an object is moved at a distance two feet in front of the face, the eyes normally move in following it; in some children the head always turns towards the object, while the eyes are kept still in their orbits. Those children are apt to be inaccurate observers, slow in reading and counting, making mistakes in adding columns of figures. This was found in 790 boys; 485 girls of whom 41.1% of boys, 45.7% of girls were reported as dull. This

want of control over eye-movements can be removed by daily drill for two or three minutes; this and the last given signs can usually be removed in backward children with great improvement of their mental status.

In making observations of these nerve-signs, it is important that the observer should be acquainted what to look at and what to look for, as well as with methods of description. I have elsewhere catalogued 20 such signs with reference to their respective significance. My object here is to interest the reader in such methods of study<sup>1</sup> and I will now state some propositions concerning childhood, omitting the statistical evidence in proof which has previously been published. They indicate some points of general interest to those who wish for further knowledge of child life and have a bearing on education. These show that much information may be gained by the scientific study of children bearing on the methods and practice of education.

I. The high mortality under 5 years falls principally on males and is probably largely due to congenital developmental defects. The result is there are more girls than boys to be educated.

II. The percentage with defects in development, abnormal nerve-signs and mental dullness is higher among boys, while the girls show a higher proportion pale, thin or delicate.

III. Children with indications of brain disorderliness (abnormal nerve-signs) are often dull pupils. Hence the importance of the observation of these visible signs, and of training adapted to remove them, e. g. If good control of the movements of the eyes

<sup>1</sup> "The Nervous System of the Child, Its Growth and Health in Education." Author Macmillan Co., N. Y. and Macmillan & Co., London.

<sup>2</sup> See Chapter IV on "Study of Children." Ch. V, VI.

and an habitual straight balance of the hands is trained something is being done to improve the child's brain-power.

IV. Delicate children are often dull. It is noteworthy that the association of abnormal nerve-signs and delicacy rises with advancing years. The delicate child, cases of heart disease, bone disease, etc. need some training to prevent the additional troubles of added neuroses; mental application and control by a teacher whose work is directed by the doctor is desirable.

V. Girls with some congenital defect in development or abnormal nerve-signs are more apt to become dull or delicate than boys similarly constituted. Defects in development and the irregular nerve-signs are more frequent among the boys, but are of greater significance in girls. The boy with some signs of fatigue, headaches and insufficient sleep is more likely to recover after a holiday than a girl; the girl with a small head is more likely to be permanently delicate, and to bear strains less well than a boy in similar condition. Good health and strength are quite as frequent among the girls who are free of any defect in development as boys, but the girl who is in some degree subnormal suffers more from it than the boy in like case.

Training<sup>1</sup> may be used adapted to remove irregular action, mental faults, backwardness or deficiency. In all children good control over eye-movements, as explained should be culti-

vated; this is the first training in "attention." Free-hand exercises in imitation of teacher's balance and movements are most useful as means of improving the brain capacity for mental work—such training may be employed in removing neuroses, lessening the uncontrolled, spreading extra-movements which often accompany stammering.

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## ASTHMA, SCIATICA AND HYSTERO-EPILEPSY TREATED BY A NEW METHOD; WITH CASE REPORTS.

BY

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In an age when life has come to be lived at an almost hysterical pace and various alienists have adopted the term "dementia Americana" for a variety of nervous disorders not defined in the text books, anything new in the treatment of nervous and mental cases is worth consideration. Remedies that are offered to the profession which are, at least, harmless and which afford the possibility of good results are worth a trial. Epilepsy, neurasthenia and the various forms of mania and dementia have presented practically an invulnerable wall to all medical attack and many milder nervous and mental affections have been overcome only with the greatest difficulty.

These are facts that occurred to me when I first was confronted with the claims made for crotalin, a product of the venom of the diamond rattlesnake. At first, I was inclined to believe that the new treatment

<sup>1</sup>"Lectures on the Growth and Means of Training the Mental Faculty." Author Cambridge University Press, England, Macmillan Co., N. Y.

must necessarily be dangerous, but, upon being convinced that this was not the case and that the injections could be given to any patient without any possibility of deleterious results, I determined to try the preparation in a number of cases that came within the scope of my practice. To the present writing, I have used snake venom in three cases of asthma, one case of sciatica and in one case of hystero-epilepsy.

It is not within the province of this article to discuss either the technique, the tangible results of this treatment, or to argue either for or against the preparation, but merely to present the case reports in order of their treatment, successes and failures alike. The first case which I wish to report is one of asthma. It is as follows:

*Case 1*—M., female, age 55 years. Occupation, housewife.

*Family History*—Negative.

*Personal History*—Negative.

*Diagnosis*—Bronchial asthma.

*Character of Attacks*.—Labored respiration; nervous; uneasy; unable to sleep.

*Frequency of Attacks*—Continuous.

*Duration of Disease*—Indefinite, but at least several years.

*Previous Treatment*—Varied medication without relief.

*Present Treatment*—September 15, 1913—Given 1/150 grain di-crotaline. Mild local reaction. Intramuscular, triceps.

September 20, 1913—Given 1/100 grain di-crotaline. Mild local reaction, and partial relief from suffering.

September 25, 1913—Given 1/50 grain di-crotaline. Mild local reaction. Complete relief.

September 30, 1913—Given 1/50 grain di-crotaline. Mild local reaction. Complete relief from distressing symptoms.

*Results*—This patient has been apparently entirely relieved of a long standing asthmatic condition by four treatments with di-crotaline. She has gained weight and strength, rests easily and seems to be in excellent general health. The treatment will be continued, however, until several additional injections have been given and the case will then be watched for any possible recurrence.

*Case 2*—F., female, age 50 years. Occupation, spinster.

*Family History*—Negative.

*Personal History*—Negative.

*Diagnosis*—Bronchial asthma.

*Character of Attacks*—Periodical nervousness; apprehensive; restless; labored respiration.

*Frequency of Attacks*—Practically continuous.

*Duration of Disease*—Twenty years.

*Previous Treatment*—Varied medication without relief.

*Present Treatment*—June 1, 1913—Given 1/150 grain di-crotaline. Violent local reaction necessitating measures for the relief of the local inflammation. Injection in triceps intramuscularly.

June 6, 1913—Given 1/100 grain di-crotaline. Violent local reaction. Asthmatic condition improved.

June 11, 1913—Given 1/75 grain di-crotaline. Violent local reaction, asthmatic condition materially improved. The patient began gaining in weight and strength.

June 16, 1913—Given 1/50 grain di-crotaline. Violent local reaction. Asthmatic condition entirely relieved.

June 21, 1913—Given 1/25 grain di-crotaline. Violent local reaction. Continued gain in weight and strength.

June 26, 1913—Given 1/12 grain di-crotaline. Violent local reaction.

July 1, 1913—Given 1/12 grain di-crotaline. Violent local reaction.

*Results*—In this case a chronic asthmatic condition of many years' standing was apparently entirely relieved after the fourth injection. Treatment was discontinued after the seventh injection. Four months have passed since the last injection was given and there has been no recurrence. The patient has gained weight and strength and is in excellent general health.

*Case 3*—D., female, age 24 years. Occupation, none.

*Family History*—Negative.

*Personal History*—Continuous nervous troubles.

*Diagnosis*—Hystero-epilepsy.

*Character of Attacks*—Gradual lapses of consciousness.

*Frequency of Attacks*—Every two to four weeks.

*Duration of Disease*—About five years.

*Present Treatment—May 1, 1913*—Given 1/200 grain di-crotalini. Severe local reaction.

*May 5, 1913*—Given 1/150 grain di-crotalini. Severe local reaction.

*May 10, 1913*—Given 1/100 grain di-crotalini. Severe local reaction.

*May 15, 1913*—Given 1/75 grain di-crotalini. Severe local reaction.

*May 20, 1913*—Given 1/50 grain di-crotalini. Severe local reaction.

*May 26, 1913*—Given 1/25 grain di-crotalini. Severe local reaction.

*May 30, 1913*—Given 1/12 grain di-crotalini. Severe local reaction.

*Results*—Treatment in this case was discontinued after seven injections had been given. The patient showed a distinct improvement.

*Case 4—M., male, age 40 years. Occupation, farmer.*

*Family History*—Negative.

*Personal History*—Negative.

*Diagnosis*—Sciatica.

*Duration of Disease*—Three years.

*Previous Treatment*—Osteopathy; electricity; baths; waters; various medication. No relief.

*Present Treatment—June 1, 1913*—Given 1/200 grain di-crotalini. Local reaction mild. All injections in hip, intramuscularly.

*June 5, 1913*—Given 1/150 grain di-crotalini. Reaction mild.

*June 10, 1913*—Given 1/100 grain di-crotalini. Reaction mild.

*June 15, 1913*—Given 1/75 grain di-crotalini. Reaction mild.

*June 20, 1913*—Given 1/50 grain di-crotalini. Reaction mild.

*June 25, 1913*—Given 1/25 grain di-crotalini. Mild reaction.

*June 30, 1913*—Given 1/12 grain di-crotalini. Mild reaction.

*Results*—The treatment was discontinued after seven injections, the patient refusing to go on with it. No benefit had been accomplished to the case. It is possible that the dosage was too mild or that treatment was discontinued too soon.

*Case 5—G., male, age 44 years. Occupation, hardware merchant.*

*Family History*—Negative.

*Personal History*—Chronic gastric disorders. Suspected of pulmonary tuberculosis. Anemic.

*Diagnosis*—Bronchial asthma.

*Character of Attacks*—Labored respiration; increased temperature; weakness; coughing; nervousness; unable to sleep; chronic gastritis.

*Frequency of Attacks*—Practically continuous.

*Duration of Disease*—Thirty years.

*Previous Treatment*—Varied medication without relief.

*Present Treatment—July 15, 1913*—Given 1/100 grain di-crotalini. Intramuscular injection in triceps. Local reaction severe.

*July 20, 1913*—Given 1/75 grain di-crotalini. Reaction pronounced.

*July 25, 1913*—Given 1/50 grain di-crotalini. Pronounced local reaction.

*July 30, 1913*—Given 1/25 grain di-crotalini. Severe local reaction.

*Aug. 10, 1913*—Given 1/12 grain di-crotalini. Severe local reaction.

*Aug. 15, 1913*—Given 1/12 grain di-crotalini. Severe local reaction.

*Results*—The patient showed no improvement after having had seven treatments and refused to continue the course.

**Conclusion.**—In reviewing the cases recorded above, it is my opinion that the venom preparation is useful in bronchial asthma and that it will give satisfactory results in a good many cases. It is worth trying in epilepsy and other mental and nervous cases. Personally, my observations of the action of snake venom warrant me in trying it in all cases that come within the scope of effectiveness claimed for it.

## HEMORRHOIDS.

Hemorrhoids and other rectal troubles such as fissures, general irritation of the rectum and pruritus ani are conditions induced by the absorption of toxin-laden moisture from the fecal matter, including all the toxins there contained. This results in irritation of the nervous system and a drain upon the brain and nerve centers that leads anywhere you want to go, and a whole lot of places you don't want to go.—Dr. Thornton, in *Ellingwood's Therapeutist*.

# THE ANNOTATOR



**Muzzling the Dogs.**—The New York City Board of Health order that all dogs be muzzled, even those on leash, has created considerable resentment among those who think they love dogs more than the rest of us do. As a matter of fact the license to let dogs run free to bite other animals is nothing short of cruelty to our own pets, companions and keepers. It

is our place to protect these helpless dumb brutes from injury. If an unmuzzled dog should slip his leash he could easily kill one with a muzzle. The medical side of the matter is the fact that an epidemic of rabies has slowly spread through the state of New York and has caused much damage to man and beast. The only way to stop it, is to muzzle all dogs so that the infected ones cannot transmit it. In this way England so completely eliminated the disease that she has not had a case for many years, though it was once well nigh a scourge. No dog can enter the Islands except after a prolonged quarantine for observation. There may not be much chance of eliminating the disease from this country, because a reservoir of the infection seems to exist among certain wild animals which do not die of it, such as skunks in the unsettled parts of the west. They may keep it alive like the wild cattle of Africa keep up trypanosomiasis, and rodents of Asia, plague, and possibly monkeys, yellow fever. Indeed we would not be surprised if the human form of the malaria parasite were found in a lower animal too. But there is no doubt that the muzzling of dogs effectually ends a local outbreak of rabies where there are no wild animals to keep it up. Owners in self interest therefore should support this measure of safety instead of opposing it. Certain self-styled

humane folks could not be in worse business than in their persistent assertions that rabies is purely imaginary, and muzzling therefore a useless cruelty. It is neither cruel nor useless.



**Football Fatalities.**—The death of a young student of Fordham University High School Department, from rupture of the intestines, began the season's record of fatalities in American football. The often announced reform of the rules to make the sport less dangerous, does not seem to have changed matters much. Some years ago we were inclined to the

opinion that the enormous number of deaths and disabling injuries would create a popular demand for the abolition of the game—not its reform. It seems on the contrary that the popularity of the sport is increasing and there is no hope whatever of its abolition. The form it has taken in America is the evolution of more than a quarter of a century, and seems to be exactly what the spectators want. The European form is too tame for us. Perhaps then we might ease-up its worst features to make it less deadly. There has been some improvement, but far too little. The subject is one for serious consideration by parents. Boys cannot be put into glass cases and kept from all danger. It is the nature of this animal to delight in risks which adults avoid, so perhaps football is liked because it is risky. A parental prohibition may not do much good because the majority of parents seem proud to have a son husky enough to be in the game. On them rests the ultimate responsibility for the deaths and permanent disabilities.

**The Exhausted Soldier.**—Physical and mental exhaustion of soldiers in campaign is a matter which military commanders are



prone to ignore in the haste of making forced marches. The skillful commander knows exactly how much effort his soldiers can make without becoming too fatigued to fight. It is often necessary to rest an army even in the progress of a prolonged battle. In addition, nutrition must be kept up, but if the soldiers march too quickly for their wagon trains they go hungry. There is some evidence that plans of campaign have failed more than once because of the exhaustion of the soldiers from over exertion and lack of food. Some captured men were almost in a condition of shock, indeed it was shock, but it was cured by a nourishing meal and a long sleep. It is quite possible that the annual manoeuvres extending over a period of two or three weeks have exacted more labor from soldiers than could be kept up in a long campaign and that the attempt to do in war as in manoeuvres is directly responsible for certain disasters. They have neglected the basic principles of warfare, and as these are matters of physiology, it is evident that the system of preparation was faulty through the habit of ignoring medical advice.

cause severe headaches lasting many hours afterwards. There seems no dissent from the opinion that recovery may be delayed or even prevented. The quiet zones around hospitals have done great good, and the suppression of noises elsewhere have been a boon to the rest of us, but there is still much more to be done. The movement now hinges on the damage done to healthy people. It has long been an axiom of physiology that nerves cease to react unpleasantly to a stimulus often repeated, and that a noise which at first is exquisitely painful may be tolerated in time. Boiler makers are held up as examples. So we have been in the habit of saying that habitual noise is harmless to the healthy. There are signs of a reversal of this opinion and many medical observers are being quoted to the effect that the ear piercing noises and rumbles of daily life particularly in railroad travel are not only painful but observably injurious to the nervous system, even when we have become so accustomed to them that we do not notice them. This seems reasonable, for pain is always a signal of injury and when the pain is dulled by repetition the cause still acts. At any rate every noise is new and painful to someone. No matter what the physiology and pathology may be, we are quite sure that the suppression of avoidable noise is an excellent thing. A nuisance should be abated even if we cannot prove it injures health, for it is doubtful whether a nuisance ever is harmless. It is a movement then which the medical profession can and should accelerate.

**The Anti-noise Crusade.**—The movement for the suppression of avoidable noises, shows signs of reawakening after some years of partial sleep. Perhaps it would be better to say that the great public is being convinced of the damage done by nerve racking noises and are joining in the crusade. The leaders have not been asleep nor has their enthusiasm diminished. Formerly the plea was always for the sick, as it is a matter of daily experience that in the weakened condition of illness or convalescence, noises are not only painful of themselves but may



**Alien Patentees in War.**—The British nation has been puzzled to determine what to do with the patents held by Germans. It would of course be folly to give the royalties to the patentee who would probably use them to aid his own country. The first proposition was to vacate all such patents and let anyone make the things.

This would be rather hard on non-combatants who are theoretically protected by modern laws of war, though as a matter of fact, the peaceful inhabitants



always suffer more or less, and in this war they seem to be injured more than ever. Extermination of non-combatants was the purpose of ancient war, and in a modified way it is the purpose of the present one, for the nations openly state that they want the means of livelihood which their enemies have built up or want to retain their own. So the non-combatants have no cause for complaint if they are injured, though we ought to help them if possible. As a temporary expedient, the British government has concluded to collect all the royalties itself and dispose of the fund after the war in a way which circumstances prove the wisest. This brings up the question as to what we are to do with foreign owned patents on articles made abroad but not now imported. We understand that a law is proposed vacating a patent if the production of the article is suspended in anyway. Patents are given to aid industry but if not used they act in restraint of manufacture and trade contrary to the express wording of the constitution. In the future we should stipulate that if a patent is given to an alien, the article must be made in the United States or the patent lapses.



**Misplaced Sympathy of Refugees.**—There is a great deal of mistaken sentimentalism in the references to refugees driven from home by the war. Many of the pictures so far published, indeed, show able bodied young men flying from danger whereas they should be going towards it like men. They should be with the troops defending home and fireside and if they are not they are playing a part worse than cowardly for they are leaving the defense to others. If it were not for these shirks probably there would not be so many women, children and old people driven from home. Hardy mountaineers in many parts of Europe have maintained their independence because everyone goes out to fight for it—even the women. We can scarcely imagine our colonial ancestors running away because Indians attacked the settlement. There would never

have been a United States of America, if every settler had not done a share of the defense, and this includes the women.

The proposition to welcome these young men to our shores should be checked, for we do not want citizens who will refuse to defend the country when our time comes to resist invasion. Peace faddists believe we will never have another war, but it would be folly to act on such a belief. If it should come, our independence and our prosperity will cease if citizens run away. This has no apparent relation to medicine, beyond the fact that every doctor is professionally and patriotically interested in having the right kind of immigration.

**Institutional Epidemics.**—The recent outbreak of a fever in an orphan asylum in Arlington, N. J., directs attention to the frequency with which the press chronicles epidemics in all institutions for the care of the helpless or criminal. No sooner do we get over the shock of the spread of scarlet fever to practically all the convicts in a prison, when we learn

of typhoid fever in another. Orphan asylums seem to be particularly prone to outbreaks of diphtheria, though all the diseases of childhood naturally have ideal chances to spread. Something is wrong, What is it? Only a few years ago we were shocked to learn that all foundlings soon died in spite of institutional care given to them. We then realized that each of these delicate pink bits of humanity required the care of one, two or more persons, and that one nurse could not possibly give proper attention to several infants. So we tried the successful experiment of placing each baby in a family where it could inspire love as well as pity, for without love no woman can sacrifice herself sufficiently to give a baby the unremitting attention upon which its life depends. We have been wondering whether there is not a similar fault in all institutions for children. The pitiful and mournful little tots seem so utterly lacking in normal noisy exuberance and so subdued and unnatural that something must be

wrong. They are deprived of the needed comfort of coddling and must be starving for love. Could this put them in a condition of hyper-susceptibility to infection? The identical condition in adults has been dignified by a name-nostalgia—because it is a serious matter in soldiers and has been known to be fatal of itself, as well as to make them easy and early victims of camp infections so common in crowds. In addition, the child survives because more or less isolated from others. Crowding is unnatural, yet orphan asylums and other institutions have done such incalculable good, that it seems almost a crime to say anything against the system. To be sure, the fixed policy is to find a home for each child as soon as possible, but in the meantime should there not be more pains taken to prevent the introduction of infection among these specially susceptible little unfortunates? We are quite sure there is nothing bordering on neglect, but merely a too prevalent ignorance of the fact that more care is needed than in the family.

who have been raised in cities, as is the case among certain immigrants in the United States and among primitive peoples hitherto exempt from tuberculosis who meet white settlers in their native lands. Their strong and extraordinary vulnerability in contact with tubercle bacilli is to be considered a physiological trait of humanity irrespective of race, geographical position, and social or economic conditions. On the other hand, the resistance to tuberculous infection of the adult population in civilized communities is undoubtedly of pathological origin, being, as it is, an expression of an acquired specific immunity through mild infection during childhood.

This acquired immunity of the tuberculous to tuberculosis is the greatest safeguard against superinfections and reinfections with new strains of tubercle bacilli which are ubiquitous and cannot be avoided in modern large cities. In cases in which, because of some disturbance in physiological function or pathological derangement, there occurs a failure in the immunity and the bacilli harbored within the body since childhood, are permitted to proliferate, no acute miliary tuberculosis occurs as a rule, but chronic phthisis is observed, which is localized and circumscribed and is amenable to spontaneous or therapeutic cure. Experience also teaches that primary infection is most dangerous during infancy and in the adult, while during childhood mild tuberculous infections are in the vast majority of cases benign and, because the body is thus immunized against reinfection, even beneficial.

We find here an explanation why in tubercularized countries the mortality from this disease is on the decline, while in countries into which tuberculosis is only recently introduced for the first time, the death rates are high. In countries where there is tuberculosis, it attacks all adults and children who have not been benefited by tubercularization or mild infections during childhood. Meeting virgin soil or susceptible elements, the tubercle bacilli produce in most cases acute and fatal hematogenous tuberculosis. This we find to be true among the robust Indians in this country, who still live a healthful outdoor life, as well as among the immigrants from southern and eastern Europe who come here from villages and agricultural settlements where they have been free from tuberculosis infection, and settle in large industrial cities with an abundance of tubercle bacilli.

The prophylaxis of phthisis is therefore to be directed along the lines of prevention of massive infections of children, especially infants, because they are liable to be the forerunners of phthisis in the adult. The phthisiophobia of adults born and bred in cities is unjustified, because nearly all have already been infected during childhood and can not be reinfected, as is well illustrated by the rarity of phthisis in both husband and wife. These mild infections during childhood which can hardly be avoided irrespective of the strenuous prophylactic means recently taken, while pathological in character, are to be

## ETOLOGY AND DIAGNOSIS



**Tubercularization and Immunization.**—The following are the conclusions of an article by Maurice Fishberg (*N. Y. Med. Jour.*, Sept. 19, 1914).

In civilized countries, especially in industrial cities in which careful investigations have been made, it was ascertained that the population has been thoroughly tubercularized, and that nearly every person has been infected before reaching maturity, notwithstanding the strong efforts made to prevent infection. On the other hand, primitive peoples who have not come into intimate contact with civilized and tubercularized humanity and who, excepting their outdoor life, live under inferior hygienic and sanitary conditions even when compared with the slum population of modern large industrial cities, have no tuberculosis at all.

Individuals free from tuberculous infection are very susceptible to the pernicious effects of tubercle bacilli. Even the strong and robust constitution of the average rural inhabitant is of no avail when he comes into a tuberculous milieu while emigrating to a large city, and he succumbs more easily than those

considered beneficial because thereby civilized humanity has actually been vaccinated against new infections with virulent tubercle bacilli to which every one living in a modern city is always exposed.

Among adults the prevention of metastatic auto-infection with bacilli harbored within the body since childhood can be prevented at the present state of our knowledge of phthisiogenesis only by the improvement of the social, economic, hygienic, and sanitary conditions which may be conducive to the physiological standard of health and well being of each individual in the community and so preserved the balance in the required immunity characteristic of civilized and tubercularized humanity.

**The Tongue In Diagnosis.**—For examination the tongue (*Dietetic and Hygienic Gazette*, Sept., 1914) should be protruded as far as possible, and the whole surface should be inspected. An abnormal appearance points (1) to fevers, (2) to local lesions, (3) to some disorder in the digestive tract, or (4) to various morbid conditions not included in the first three divisions.

1. In fevers the tongue is generally coated or furred, dry, sometimes fissured, and is apt to look dirty and the mouth to be bad smelling. In typhoid, when a brown furred tongue becomes darker and thicker, and sordes appear on the teeth and lips, the condition is serious. When the tongue begins to "clear up" we expect convalescence when the coating reforms, we fear a relapse. The tongue is tremendous in several fevers, where there is extreme exhaustion. Occasionally there is an abnormally red tongue, due to denuding of the epithelium; this appearance may at times be detected beneath the coating.

2. A coated tongue may be caused by decayed teeth, or enlarged tonsils or excessive smoking. Other local manifestations are the mucous patches of syphilis, which especially in children, must not be confounded with the patches of stomatitis. Chancre may be found, or there may be circumscribed swelling and hardness, which would mean either syphilis or cancer, to establish the diagnosis between which it may be necessary to cut out a piece for microscopic examination. Depressed scars upon the surface would indicate healed specific ulcers. We may find in epileptics scars due to biting the tongue. Finally the tongue may be stained by drugs, or acids or alkalies.

2. A furred or coated tongue occurs in disorders of the digestive tract. Constipation produces this; or a brown furred tongue with a bad taste may appear the "morning after" the patient has wined and dined generously. A coated tongue with a yellowish hue would draw attention to the liver. When the tongue looks raw, like beefsteak and of an unnaturally clean, smooth and perhaps glazed appearance, it points to gastric or intestinal irritability; this means shedding of intestinal epithelium with consequent loss of power of absorption—a serious condition, for here the

supply of nutritive material of the system is interfered with.

4. The color of the tongue is affected by that of the blood: thus, a pale, flabby indented tongue, indicates thin and poor blood, as in anemia and chronic wasting diseases. It is said that a swollen and indented tongue, presenting also a sort of a silvery sheen, suggests menorrhagia. The tongue is dry in diabetes and in other conditions where the bulk of urine is large. It is tremulous in chronic alcoholism, in many nervous diseases, and in acid and mercurial poisoning. A tongue looking as if covered with white paint is characteristic of malaria. The "strawberry tongue" of scarlet bright red, with papilla prominent, to scarlet fever.

**Diagnosis and Treatment of Early Pulmonary Tuberculosis.**—J. B. Hawkes, 2d, states (*Boston Med. and Surg. Jour.*, Aug. 27, 1914) that there are two grave mistakes which any physician may make in the diagnosis of early pulmonary tuberculosis. The first and most important of these errors is putting off making a diagnosis until too late; the second consists in making a diagnosis on insufficient evidence. The chief factors which lead many doctors to delay making a positive diagnosis of incipient consumption and instituting treatment may be grouped as follows: (1) Waiting for a positive sputum. (2) Disregard of the fact that a hemorrhage from the mouth almost always means pulmonary tuberculosis. (3) Failure to note and give due weight to constitutional signs and symptoms. Such signs and symptoms may be: Fever and rapid pulse. Unexplained loss of weight. Loss of strength and energy. Undue fatigue and ease of tire. (4) Failure to take a careful history. (5) Unwillingness to make a definite diagnosis for fear of losing the patient or of making a mistake. (6) Being in too much of a hurry. The chief factors in causing errors on insufficient evidence are: (1) Failure to remember that in young adults particularly, extensive signs in the lungs without constitutional signs or symptoms are often not of tuberculous origin. (2) Disregard of the fact that in children processes due to either pneumonia or influenza may cause consolidation, produce symptoms, and run a course resembling a tuberculous process in every detail. (3) Ignorance or forgetfulness of the fact that exophthalmic goiter often closely resembles incipient phthisis. (4) Forgetting that pulmonary syphilis is not as rare as is commonly supposed. (5) Failure to bear in mind that it is perfectly possible for a person to lose weight and strength, become weak and anemic, and even develop a cough and run a fever without these being due to tuberculosis.

**Removal of Tonsils.**—Some of the chief indications which render complete removal advisable according to McCurry (*Pediatrics*, Sept., 1914) are:

1. Any interference with respiration, night or day.

2. Threatened alteration of voice or articulation.
3. Eustachian catarrh, or the presence of middle ear affections.
4. Chronic enlargements of the cervical gland.
5. Chronic lacunae tonsillitis or the cheesy collections in the supratonsillar fossa or between the tonsil and the pillars.
6. If adenoids are present and are to be operated on, the opportunity of the anesthetic should be utilized to remove any decided tonsillar hypertrophy.
7. Attacks due to septic absorption through the tonsils or a chronic condition of ill-health which can be attributed to infection through the tonsillar area.
8. Frequent attacks of tonsillar inflammation or of peritonsillar abscess.

In most cases it is the septic state of tonsils, rather than size, which determines the question of removal. Some of the largest tonsils give rise to the least local inflammatory trouble. Again, in regard to the removal of tonsils with adenoids, it is sometimes held that if the latter are cleared away the palatine tonsils will atrophy.

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**The Technique of Instrumental Examination of the Rectum.**—Drucek, in a very comprehensive article points out that that part of the rectum beyond the reach of the finger may be examined by means of bougies or sounds, although their use is open to criticism and often is contraindicated. Only soft, flexible rubber instruments (Wales's bougies) should be employed, and these must be handled with great caution. They should be hollow, so as to permit the injection of fluid through them into the part beyond, thus dilating the rectum in advance in effacing any folds that might obstruct their introduction.

Too great value must not be placed upon bougies, inasmuch as their field of usefulness is limited, and even in a healthy bowel the sensation of obstruction often is produced, and may be misleading. I have yet to see a student who did not find a stricture the first time he introduced a bougie, because the sound often impinges upon the wall of the bowel between the folds of the gut; or, it may strike the uterus or prostate gland, or the promontory of the sacrum. There is always danger of a metal or hard-rubber sound penetrating the gut, especially in cancer or ulceration. Sometimes the socalled third sphincter, which is only a semilunar transverse fold of the anterior and the right sides of the rectum, about six to eight centimeters above the anus, may catch the bougie. Normally the bougie may be introduced with care to the middle of the sigmoid flexure. If the mesocolon of the sigmoid flexure is very long, the bougies may be felt on the right side and lead the examiner to think it had perforated the bowel.

The probe has no place in the diagnostics of

rectal diseases and very little in the treatment, except in fistula. Even here its value is very limited.

Irrigations and injections are sometimes employed for diagnostic purposes, and are best accomplished in the knee-chest or dorsal position.

The speculum corroborates the digital findings, and aids in the diagnosis where the finger fails; but it by no means supercedes the latter. Resort to it is indicated where obscure hemorrhage, pain or discharge is an important symptom. The internal openings of fistulas may be seen, especially if the discharge escapes during instrumentation. Internal hemorrhoids usually drop into the instrument and are easily seen.

The decision as to which is the best speculum depends upon which one the operator is more familiar with. Each instrument is constructed differently, but the more rectal examinations one makes, the less he will use the speculum. The smooth blade bivalve causes much less pain than the wire blades, but it obstructs the field of vision and exposes only a small area at one time and this speculum must, therefore, be rotated.

The cylindrical speculum permits of the most thorough work. With the patient in the knee-chest position and a speculum five inches long and one inch in diameter, the whole length of the rectum may be examined. Such a speculum is provided with an obturator to facilitate its introduction, which should be accomplished without much pain. When the obturator is withdrawn, the air rushes in and dilates the bowel, and the whole rectal wall may be inspected by moving the introduced end about, at the same time gradually withdrawing the instrument. The mucous membrane directly in front of the speculum is flattened out, and can be viewed easily by gently pushing the speculum up after the obturator has been removed.

By putting the patient under the influence of a gentle anesthetic, many of the obstacles to the examination are removed and the field may be explored thoroughly; the sphincter completely relaxes, pain is obviated, and in such cases it is well to be prepared to do any necessary surgical treatment in order to avoid a second anesthetic. When the patient is anesthetized, an ordinary flat retractor frequently makes a very satisfactory speculum. A cylindrical speculum ten to thirteen inches long may be introduced, and the sigmoid flexure explored; but, as the great majority of rectal troubles are near the anus, a short and wide speculum is preferable.

When the patient is in the knee-chest position, the chest should be well down on the table. All constrictions at the waist must be removed.

In many instances, owing to local disease or reflex nervous excitement, we find the sphincter abnormally contracted, making an examination very painful, and often impossible without some previous preparation.

An old-fashioned way of overcoming these difficulties was, to anesthetize the patient, and, with the thumbs introduced through the anus and then drawn forcibly out to the ischial tuberosities, to tear and strain the sphincters until paralyzed. Such a procedure is unnecessary, and should be relegated to the surgical scrap-heap.



**The Common Forms of Alopecia and their Treatment**—Dore, in the *Clinical Journal* of January 21, 1914, writes on this topic. Concerning the subject of toxic alopecia and its treatment he says that the treatment of commencing baldness of the type we are considering is chiefly that of seborrhea with which it is associated. If the seborrhea is a preponderating feature its removal will usually be followed by cessation of the hair fall, and in early and acute cases by re-growth. But it is important to remember that, as Sabouraud graphically puts it, there is a long pathological history behind each patient, and the hair, which has been completely destroyed by a slow and insidious process extending over many years, cannot be regained. In other words, we are paying the penalty for the neglect of the scalp in our youth and adolescence, when much might have been done to prevent the loss of hair. Another fact to be remembered is the inaccessibility and impermeability of the hair-follicles by drugs, so that the treatment of seborrhea is similar to that of ringworm, and no mere perfunctory dabbing on of a little lotion or ointment can be expected to eradicate which is really a deep-seated disease.

It would be impossible to refer to all the preparations that have been extolled for their hair-restoring properties. Dore only mentions a few he has found useful in practice. In seborrhea cases resorcin or salicylic acid, perchloride of mercury, sulphur, and tar are the best drugs. The last two are somewhat objectionable on account of their unpleasant odor, and are usually prescribed in the form of ointment. In the majority of cases a lotion is all that is required and is much preferred by the patient. A useful one is the following:

Hydrg. chlor. corrosivi, gr. ss-ij;  
Resorcin vel acidi salicylici, gr. v-x;  
Olei lavand., min. i-ij;  
Olei ricini vel glycerini, min. v-x;  
Spt. vini rect., q. s. ad f3j.

If the scalp is dry the castor oil may be increased in quantity; if excessively greasy a solvent of fat such as ether or acetone may be added. A spirit lotion is the best dressing for the hair of women; in men, water or weak

spirit with glycerin instead of castor oil is sometimes preferable. Resorcin discolors white or very fair hair, and salicylic acid should then be substituted. Euresol, the monoacetate of resorcin, has been recommended by several dermatologists, and can now be obtained free from its unpleasant odor; it does not discolor white hair, but in other respects he has not found it superior to resorcin itself.

In severe cases an ointment may be required at first and may be rubbed in every night and washed off in the morning, or a small quantity applied once or twice a week after shampooing, e. g.:

Naphthol B, gr. v-x;  
Sulph. precip., gr. x-xx;  
Resorcin, gr. x-xx;  
Oli. lavand., min. i-ij;  
Vaselini, gr. ad 3j.

When seborrhea is not a marked feature, as in toxic and nervous cases, pilocarpine may be substituted for the perchloride of mercury in the first prescription or prescribed with ammonia or other stimulant, e. g.:

Pilocarpini nitrat., gr. v;  
Liq. ammon. fort., 3j;  
Tinct. lavand., co., 3j.  
Spt. vini rect., f3jss;  
Aque, q. s. ad f3vj.

This lotion is also effective in slight degree of seborrhea, because the ammonia forms a soap with the fat of the scalp.

Other useful stimulants are chloral hydrate, acetic acid, and cantharides; the last should be used with caution on account of its action on the kidneys. Formalin is contained in several of the proprietary remedies, but has proved disappointing in Dore's hands.

Internal medication should not be forgotten, especially in neurotic and anemic cases, and the glycerophosphates, cod-liver oil, iron, strichnine, and arsenic are of service.

The employment of vaccines of the microbacillus of seborrhea at one time held out a hope of a scientific treatment of baldness, and Dore has observed one or two patients in which the seborrhea was checked for a time, and accompanied by renewed growth of hair, but unfortunately the improvement was only temporary. As yet the method is only applicable to certain selected cases, and has not proved sufficiently successful to warrant its systematic use. Massage and the high-frequency current are sometimes of service, but such methods are the happy hunting-ground of unauthorized persons and are often persisted in long after they have ceased to do good.

There is no royal road to the cure of baldness, and the multitude of preparations advertised as infallible hair-restorers is an indication of the failure of most of them to accomplish what they profess.

**Diphtheria Antitoxin**.—It may be thought by some, says an editorial writer in *J. A. M. A.* (Sept. 5, 1914), that the whole question of the use of antitoxin in diphtheria is settled. Nev-

ertheless, it may be worth while to emphasize certain factors that are not always borne in mind in using it. The chief ones are the quantity to be given and the time and method of administration. The average dose is given in the Pharmacopæia as 3,000 units. While probably a sufficient initial dose in many cases, this quantity is not enough to satisfy the factor of safety. Although 3,000 units will neutralize the toxins formed in the human organism in an average case, it must be remembered that some time elapses before complete absorption takes place and hence before all the antitoxin becomes effective. Meanwhile the average case at the time of injection has become a severe if not a fatal one. A severe case terminating fatally might have remained a mild, average case had a larger initial dose been given. There is a daily growing sentiment that the amount necessary to effect a cure should be given in one dose at the earliest possible hour. Woody states that "no case of diphtheria, however mild, should receive less than 10,000 units." His experience covers almost ten thousand cases and shows a reduction in mortality of 3 per cent. when large doses are used as compared with smaller ones. The point is emphasized by Anderson that 10,000 units are of more value when given early than 100,000 or 200,000 when given later. It is safe to say that 10,000 units would be much nearer the average dose used in the large metropolitan hospitals than the 3,000 units stipulated in the Pharmacopæia. Although promptness of administration after the onset of the first signs and symptoms has been proved to be the most important element in the successful use of antitoxin treatment, there must be considered as well the method of injection. Smith and Park have shown that when the subcutaneous route is used, the maximum amount of antitoxin is found in the circulating blood only after three or four days. If antitoxin is given intramuscularly this period is of course shortened. It is still further shortened by intravenous injection, which method has been advised for extremely severe cases. When this extreme method is adopted a much smaller amount of antitoxin is required, as action is immediate. It cannot be too often emphasized that antitoxin must be given early; that with a small patch of membrane a smaller dosage may be required than when a complete laryngeal, pharyngeal and nasal involvement exists, and that the subcutaneous injections are more slowly absorbed than deep intramuscular ones. The authority of the Pharmacopæia, in its forthcoming revision, should be lent to the aid of experience by stipulation of a larger average dose—for example, 10,000 units—and a sliding scale to inform the physician that the great quantities are sometimes essential.

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**Vesical Tuberculosis.**—Keyes, (*New York Medical Journal*, September 5, 1914), refers to the use of thalline, gomenol and bichloride of mercury in the treatment of tuberculosis of

the bladder and says that carbolic acid acts when the foregoing fail. The results obtained by installations of bichloride of mercury into the tuberculous bladder are often gratifying. But several of Keyes' patients who had proved refractory to treatment with tuberculin as well as with instillations of bichloride of mercury, have been markedly relieved by instillations of carbolic acid.

Rovsing suggested the use of this acid for the treatment of bladder tuberculosis, but no one has been able to achieve with Rovsing's method the success announced for it by its distinguished originator. He employs an irrigation of carbolic acid in five per cent. solution. He states that this solution should be injected into the bladder and permitted to flow out again, again reinjected, and so on, until the solution no longer returns smoky. The amount injected approximates the bladder capacity. The author has not employed the treatment, but can well believe Rovsing's statement, that the pain occasioned by it is considerable, and question whether the results are likely to justify the agony which these injections must excite. He has, therefore, modified Rovsing's treatment to the extent of employing carbolic acid in instillation instead of irrigation, and in solutions of a strength varying in accordance with the sensitiveness of the patient.

One may safely begin with a solution of one to 200 of water and rapidly increase this to one per cent. before the patient complains of an increase in pain. The half dozen patients upon whom Keyes has been able to employ this technic have shown no great benefit until the solution reached a strength of from two to five per cent. In two instances he has even employed a supersaturated solution, drawing into the instillator a few minimis of pure carbolic acid, and then a few minimis of water, thus making an emulsion, of which one or two minimis may be instilled into the posterior urethra. The reaction from such an instillation is likely to be very marked. Its use is justified only where all else fails. It is not necessarily any more efficacious than the solutions.

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**New Treatment for Ringworm.**—Foley in the *London Lancet*, describes his method as follows:

The part, having first been washed with a strong solution of sodium bicarbonate, is next swabbed with a piece of lint moistened with spirit of ether—to remove any grease. When dry, it is painted with tincture of iodine and immediately after an ethyl-chloride spray is applied. The author finds it best to work with a pair of ethyl-chloride tubes in each hand, as he thus covers a larger area in quicker time. The deeper the disease-process penetrates, the longer the spray must be applied. He continues spraying until the integument becomes china-white.

It will be found that in from twenty-four to

forty-eight hours the patch of ringworm has become quiescent. Next, little tiny spots should be looked for and these treated in a similar manner. They also will disappear in from a few days to a week. In ringworm of the scalp, three or four applications of iodine and the spray are required, but on the face or smooth surfaces one application suffices.

Foley declares that by the use of this method he has succeeded in curing in a week cases of ringworm that have persisted for months, and thus far it has never failed.

**Treatment of Furunculosis.**—Rishl, *Journal de médecine de Paris* for October 4, 1913, recommends the use of a two per cent. solution of salicylic acid, used as a lotion around a furuncle each time the latter is dressed, for the purpose of preventing infection of healthy skin areas.

To accomplish desquamation of the epidermis where it is infected with staphylococci, the area should first be lightly rubbed with ether or benzine, to remove fats, and the following paste then used:

R Betanaphtholis ..... partes 5;  
Sulphuris sublimati .... partes 25;  
Saponis.. { ..... äa partes 10.  
Petrolati. { .....

M. et ft. pasta.

This should be applied in a layer one or two mm. thick. In a minute or two the patient will experience a sensation of burning, which will disappear spontaneously in about ten minutes. The paste should be removed with the spatula about ten minutes after its application, the area then washed with benzine or ether, and some bland powder applied. Correctly used, the paste leaves a local redness, which disappears in an hour's time at most.

The same procedure should be gone through on the following days, until the stratum corneum has assumed a parchmentlike appearance. Throughout the treatment no water should be allowed to come in contact with the involved area, which, however, should be washed over at frequent intervals with alcohol to which one or two per cent. of resorcinol or salicylic acid has been added, followed by dusting with a bland powder. The desired result will usually be obtained after three or four day's treatment.

**A Simple Method of Treating Warts.**—The method in question consists in covering the wart and the surrounding skin, to the width of 1 centimetre, with ordinary caoutchouc plaster, and leaving it so covered for weeks—even, if necessary, for two or three months. Whenever the plaster becomes loose it must be removed and replaced by a new piece. As a rule, the plaster is to be changed once in three or four days. Any adherent residue of the caoutchouc is to be removed with ether or

petrol, care being taken that the wart or the surrounding skin shall not be rubbed energetically, because irritation of the skin is not conducive to the disappearing of the wart. The author offers no explanation for the action of this simple method, and how it produces such excellent results from the cosmetic point of view, unless it is that the caoutchouc contains some substance which softens the wart and causes atrophy, but it is certainly efficient.—Dr. F. Szontagh (*Lancet*, March 14, 1914).

**Headache in Children.**—The frequency and significance of headache in very young children, says an editorial writer in *Pediatrics* (September, 1914), is a subject to which adequate importance is, perhaps, seldom attached by the average practitioner. It is often a symptom of organic and functional disease, sometimes of a serious nature. Acute headache with rising temperature is common as a prodromal symptom of the infectious or toxic diseases, and its character and concomitants are of diagnostic value.

In tuberculous meningitis, for instance, the intensity of the pain is disproportionate to the degree of pyrexia. It is not very intense, but rather constant, and shifting the position of the patient has no effect upon it, but it produces a craving for rest and quiet. An acute headache, accompanied by vomiting, and a slow and irregular pulse is indicative of meningitis.

Chronic headache, on the other hand, may proceed, among other causes, from rapid growth. At least, such is the conclusion reached by Cattaneo (*Clin. Med.*). He notes that it is often observed in rapidly growing boys at the age of nine to eleven years, generally occurring in the morning and in a frontal location. Such headaches cease with the period of rapid growth, but may generally be dissipated by rest and tonics, as they are aggravated by overwork. Vague pains in other parts of the body, especially in the knees, are often complained of at the same time, and the children suffering from them are invariably of the nervous type. Occasionally they are found to have epiphysitis or cardiac hypertrophy.

Physical or mental fatigue, carried to excess, will produce headache in children, and thus it is of common occurrence in school children, either those who are exceptionally quick and ambitious and eager to subject themselves to extra strain, or among those who are slow and "backward" to a degree that makes the accomplishment of ordinary tasks a painful effort.

Defective vision, especially errors of refraction, has long been recognized as a prolific source of headache, as they are also nasopharyngeal obstruction, otitis and carious teeth. Often headaches may be attributed, with other characteristic symptoms, to anemia,

which may, in turn, be due to nephritis following some infectious fever, and quite unsuspected.

Auto-intoxication, arising most frequently in the intestinal tract, will also cause headaches in children, and may be traced not only to disease, but quite as frequently to parasites or to simple constipation. In such headaches regulation of the diet and bowels is indicated. More rarely external causes of intoxication can be discovered, in the shape of drugs or lead poisoning or carbonic acid gas.

Periodical attacks of headache, unaccompanied by fever, are observed in malaria. A chill and an enlarged spleen may accompany this headache, which is of a neuralgic character and generally supraorbital in location.

Cattaneo has found hemicrania fairly frequent in young children, and often associated with other rheumatic manifestations. He also discusses in his article the organic cerebral lesions, cerebral tumors and syphilis as related to the symptoms of headache, and after reading a contribution to the study of this subject one would not be apt to neglect or minimize in importance any headache occurring in a child.

**Constipation in Infants.**—Before we attempt to treat constipation we must discover the cause, says Pritchard, who has certain stock questions with which he plies the mother in order to elucidate the actual cause of the constipation (*Lancet*, May 16, 1914). They are as follows: (1) Are the motions hard or soft? (2) Are they large or small? (3) What remedies have you tried? (4) What food and how much have you been giving the baby? By means of these questions he can generally discover whether the rectal reflex has been tampered with by injudicious methods of stimulation, also whether the infant has been obtaining too much or too little food. If the variety of constipation does not fall under any of these headings he searches for other causes.

As regards treatment, the cure of cases of constipation due to dislocation of the normal rectal reflex can only be effected by reeducation—often a difficult matter and best promoted by massage and the teaching of a new reflex. This should be applied with absolute regularity every day.

Constipation due to excess of fat must be treated by a reduction in the percentage of cream in the case of artificially fed infants, and by controlling the quantity of milk consumed in the case of breast-fed infants, or possibly by dieting the mother. Formerly Pritchard used to treat a number of infants suffering from this variety of constipation by the routine administration of olive oil. Olive oil is of course invaluable in cases in which the infant is suffering from fat starvation, but it only aggravates the condition in the class of cases Pritchard is now referring to. It was in consequence of the realization of this mistake that he came to use

petroleum as a lubricant in place of olive oil, and since this discovery, now some eight years ago, he has practically used no other form of aperient.

Cases of constipation due to starvation very seldom come under his notice in artificially fed infants, but they are very common among breast-fed infants of the lower classes. He could give details of dozens of cases which have previously been treated ineffectually with aperients and purgatives, but which have immediately improved when the want of food had been corrected.

**Ionization Treatment of Cancer.**—Dr. G. Bettont Massey, of Philadelphia, has described his end results of twenty years' experience in the ionization of cancer (*American Journal of Surgery*, September, 1914). Of the 93 operable cases, 87 are apparently cured and 42 of the 207 inoperable. Some failures were treated by other means, and some cures had resulted in cases which had not been benefited by other methods. It is supposed that the current of electricity carries the zinc ions into the tissues where they sterilize the growth.

#### CONCLUSIONS.

My observation of the results of the ionic method in these cases, whether of cure, amelioration or failure, convinces me that it is the preferable mode of attempting immediate eradication in the following conditions:

It is an ideal method of immediate eradication of any small, circumscribed growth of the skin or mucous membranes, whether definitely malignant or merely in the suspicious condition called "precancerous" (though, strictly speaking, a cancer must be a cancer, even in its infancy). The unipolar method is exceedingly simple, bloodless, and almost painless, and by it any physician with a simple constant current office outfit may destroy in a few minutes any small, circumscribed epithelioma of the skin, eyelids, nose, mouth, rectum or vagina. The 93.5 per cent. of cures that have stood the test of years without recurrence is significant.

An extension of its value in incipient cases, particularly the bipolar technique, is the possibility of destroying by this method small carcinomas of an organ such as the tongue and breast without sacrificing the whole organ, in the rare cases in which our attention is called to them in this stage. The absolute sealing of the edges of the wound at the moment of devitalizing the small growth renders this method possibly the only one by which such an eradication may be successfully done without reinfecting the organ. The list contains several cases in both of these organs that have remained free from recurrence from six to nine years.

The second group of cases in which the bipolar method has been found to be particularly valuable is made up of those carcinomas

and sarcomas that on admission are just beyond the line of successful removal by the knife. The conditions attending ionic destruction precluding operative reinfection, the destruction may be carried deeper in growths that would necessarily be wounded in an effort at excision. This is particularly true of growths situated within cavities, which may be destroyed through the natural openings without mutilating overlying structures. In the axilla the skilful placing of the electrodes permits us to destroy the whole contents without removing the pectoral muscles.

The deaths recently reported following powerful radium treatment indicate by contrast one of the advantages of the ionic method in growths properly situated for its employment. While powerful application of radium may kill carcinoma *within the body*, with the dead tissue in intimate association with unclosed absorbents, the ionic method automatically removes its products from biologic association with the patient. After an ionic destruction the dead tissue is immediately placed outside the body biologically by the sealing of the absorbents. The patients present no rise of temperature during separation and there is no evidence whatever of absorption of toxins.

The contraindications to the method are mostly of a surgical nature, involving risk of secondary hemorrhage when large vessels lie too close to the growth; when local dissemination is too deep in recurrent cases for all parts to be reached effectively; in carcinomatosis or sarcomatosis of gland chains; in too extensive subsurface implantations, as *cancer en cuirasse*, etc. In these classes of cases the ionic method should not be used, except in some instances to remove the upper layers of a growth in preparation for intensive Roentgen ray application or for thermo-radiotherapy.

ing of flies in horse manure without lessening the value of this manure as a fertilizer for use by the farmer. It was felt that if some means of preventing the breeding of flies near a human habitation could be devised, the diseases spread by these filthy germ carriers could be greatly reduced. While the "Swat the fly campaign," traps and other devices for reducing the number of typhoid-carrying flies are of value, they are of less importance than the prevention of the breeding. It was realized, however, that no measure for preventing the breeding of flies would come into common use unless it was such that the farmer could use it on his manure pile without destroying its usefulness for growing plants, and without introducing into the soil any substance that would interfere with his crops.

As a result of experiments carried on at the Arlington Farm, in Virginia, and New Orleans, La., the investigators found that 0.62 of a pound of borax, or 0.75 of a pound of calcined colemanite (crude calcium borate) would kill the maggots and prevent practically all of the flies ordinarily breeding in eight bushels of horse manure from developing. This was proved by placing manure in cages and comparing the results from piles treated with borax and from untreated piles. The borax, it was found, killed the fly eggs and maggots in the manure and prevented their growth into flies.

In the case of garbage cans or refuse piles, two ounces of borax or calcined colemanite, costing from five cents a pound upward according to the quantity which is purchased, will effectually prevent flies from breeding.

While it can be safely stated that no injurious action has followed the application of manure treated with borax at the rate of 0.62 pound for eight bushels or even larger amounts in the case of some plants, nevertheless borax-treated manure has not been studied in connection with the growth of all crops, nor has its cumulative effect been determined. It is therefore recommended that not more than fifteen tons of the borax-treated manure should be applied per acre to the field. As truck growers use considerably more than this amount, it is suggested that all cars containing borax-treated manure be so marked, and that public health officials stipulate in their directions for this treatment that *not over 0.62 (62/100) of a pound for eight bushels of manure be used*, as it has been shown that larger amounts of borax will injure most plants. It is also recommended that all public health officials and others in recommending borax treatment for killing fly eggs and maggots in manure warn the public against the injurious effects of large amounts of borax on the growth of plants. Purchasers of manure produced in cities during the fly-breeding season should insist that the dealers from whom they purchase give them a certified statement as to whether or not the manure in the particular car or lot involved in the purchase has been treated with borax.

In feeding to hogs garbage that contains borax, care is also recommended, especially when the animals are being fattened for market.



**The Use of Borax to Prevent Flies from Breeding.**—The Department of Agriculture reports that a small amount of ordinary borax, sprinkled daily on manure, will effectively prevent the breeding of the typhoid or house fly. Similarly, the same substance applied to garbage, refuse, open toilets, damp floors and crevices in stables, cellars or markets, will prevent fly eggs from hatching. Borax will not kill the adult fly nor prevent it from laying eggs, but its thorough use will prevent any further breeding.

The investigation, which included experiments with many substances, was undertaken to discover some means of preventing the breed-

Borax is not a very poisonous substance and the feeding of garbage that contains it to hogs, is not likely to be a serious matter. On the other hand borax in large quantities does produce gastric disturbances and for this reason a certain amount of care is advisable.

The method for using this substance in the case of stables is to sprinkle the borax or colemanite in the quantities given above, by means of a flour sifter or other fine sieve, around the outer edges of the pile of horse manure. The manure should then be sprinkled immediately with two or three gallons of water to eight bushels of manure. It is essential, however, to sprinkle a little of the borax on the manure as it is added daily to the pile, instead of waiting until a full pile is obtained, because this will prevent the eggs which the flies lay on fresh manure from hatching. As the fly maggots congregate at the outer edge of the manure pile, most of the borax should be sprinkled there.

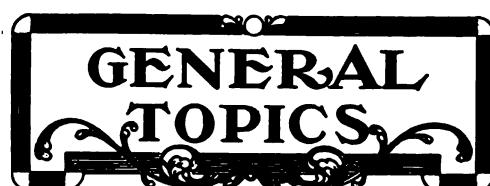
Borax costs five to six cents per pound in 100-pound lots in Washington, and it is estimated that at this rate it would cost only one cent per horse per day to prevent all breeding of flies in city stables. If calcined colemanite is purchased in large shipments, this cost should be considerable less. At the same time, if the borax is used on the manure only in the proportions stated, its value for use in the garden or for sale to farmers will not be lessened.

It is believed that this information will greatly help the health authorities in their campaign against the fly. The health authorities have long tried to prevent the breeding of flies in city stables through the use of iron sulphate as a larvacide. In the case of iron sulphate, however, a large amount is required, and other insecticides such as Paris green or potassium cyanide, while effective in killing the flies, are very expensive or extremely poisonous. Borax, which is used freely in most households, and is readily available in all parts of the country, has the advantage of being comparatively non-poisonous and non-inflammable, readily soluble in water and easy to handle. It can be purchased at retail for ten cents a pound, and a single pound used as directed in a garbage pail or open toilet may prevent the breeding of hundreds of dangerous flies.

The details of the experiments with borax and other larvacides will be found in U. S. Department of Agriculture Bulletin No. 118.

**The Role of Tobacco in the War.**—We may surely brush aside much prejudice against the use of tobacco, says an editorial writer in the *Lancet* (October 3, 1914), when we consider what a source of comfort it is to the sailor and soldier engaged in a nerve-racking campaign. With us at home it is a common experience that the smoking of a pipe, cigarette, or cigar does much to allay the restlessness and muscular irritability engendered by mental and physical fatigue. There can, indeed,

be little doubt that tobacco fills an important place in the psycho-physiological affairs of the human race, and that the habit of smoking (which does not include over-indulgence and self-poisoning) does something to temper the intensity of the struggle. There are exceptions, of course, but smoking is a custom which has widely prevailed amongst men distinguished by their soundness of judgment and by their success in the worlds of art, science, and literature—men who have played a great part in solving the problems of existence in its many difficult details. Huxley once confessed that amongst his fellow students at the hospital he was exposed to considerable temptations to smoke, but on his essaying to acquire the habit he soon found himself on the floor. He gave it up for 40 years. On the occasion of a tour in Brittany, however, he found on a very wet and cold day a companion who looked so happy with his cigar before the warm fire within the inn that he thought he would try to smoke again. "And then I found myself a changed man. I found that I was in the position of a lamentable 'pervert,' although the person who led me astray was most distinguished and a late president of the British Association. From that day I date my ruin. For, from that day, whenever smoking is going on, you may be pretty sure that I join in it." To the soldier and the sailor in the present war, with his nervous system in a ceaseless state of tension from the dangers and excitement, tobacco must be a real solace and joy when he can find time for this well-earned indulgence. Abuse of the habit is, of course, pernicious, but to quote Huxley again: "Anyone could undertake to destroy himself with green tea or any other article of diet if carried to excess." The risk, at any rate, is as nothing compared with an abuse of alcohol. The hope is thoroughly justified that the soldier in the present campaign will be generously supplied with this indisputable creature comfort.



**The Schick Test for Diphtheria Immunity.**—Drs. Park, Zingher and Serota of the New York City Dept. of Health have made numerous observations on the Schick test for diphtheria immunity (*Archives of Pediatrics*, July, 1914). An intracutaneous injection of diphtheria toxin will cause a reaction, if there is no antitoxin in the blood. The skin becomes red and infiltrated for 1-2 c. m., and the sign lasts for seven to ten

days and on fading shows superficial scaling and a persistent pigmentation.

For the carrying out of the test it is essential to have an accurate syringe with a sharp but short-pointed, fine needle. The usual 1 c. c. "Record" tuberculin syringe with a fine platinum iridium needle answers the purposes well. A standard diphtheria toxin is diluted at first 1:10 in 0.5 per cent. phenol; this dilution will keep in the ice-box with little deterioration for at least two weeks. For use further dilutions are made in normal saline, of such strength that .1 or .2 c. c. contains 1/50 MLD. for the guinea-pig. As already stated, Schick prefers .1 c. c., while we prefer .2 c. c. This amount is injected intracutaneously on the flexor surface of the arm or forearm. The persistent pigmentation may make the forearm objectionable; in such cases the surface of the arm may be chosen.

(1) The Schick reaction served as a reliable and convenient index of the susceptibility or non-susceptibility of individuals to diphtheria.

(2) It served, also, as an accurate clinical test to determine the efficiency of active immunization with mixtures of diphtheria toxin and antitoxin.

(3) It has helped us in the diagnosis of clinically doubtful nasal diphtheria. With a purulent or sanguous discharge showing the Klebs-Loeffler bacillus it is difficult to decide whether the case is a carrier or a beginning diphtheria. A negative reaction excluded clinical diphtheria, while a positive Schick reaction left the diagnosis of clinical diphtheria still a probability.

(4) It has added further experimental proof to the clinical experience that very toxic cases of diphtheria require the early intravenous administration of large doses of antitoxin.

(5) The results obtained in families seem to point to other causes in addition to bacterial infections with virulent diphtheria bacilli as determining factors in the production of natural antitoxin.

**Character of the Wounds.**—The *Berliner Med. Wochenschrift* of September 14 states that the French surgeons, Delbet, Raymond, Tuffier and Doyen, have publicly commented on the mild character of the wounds among the French soldiers when vital organs are not involved, and their rapid healing. The same comment as to the mildness of the wounds and the rapid healing among the wounded is made in the official report of the German surgeon-general, referring to the wounds made by the regulation bullets. He states further that the fifth week of the war has passed without epidemics developing in the German army. The first-aid packages have proved efficient. The bandages applied at the front were still in place when the wounded were delivered to the base hospitals, and a large proportion of the wounded are already recovering and clamoring to be sent back to the front. *Journal A. M. A.*

**Lead Poisoning.**—Linenthal (*Journ. Am. Med. Assn.*) calls attention to the importance of the early diagnosis of occupational diseases, more especially to lead poisoning. An early diagnosis is essential to protect workers and to gather information as to the prevalence of the conditions. He finds that there is a tendency among physicians to attribute too much diagnostic importance to the blue lead-line on the gums, and the presence of basophilic granules. Lead poisoning presents itself in a great many ways. Its early manifestations are not always clear, but the physician who fails to recognize them very often loses the chance he has of arresting the disease in season. Among the early symptoms, the author mentions especially the skin pallor entirely out of proportion to the actual anemia, the wasting of the fat in the face, general muscular weakness, with rheumatic pains in the joints, nausea and attacks of constipation or constipation alternating with diarrhea. General nervousness, persistent headache and dull mentality are also among the earlier manifestations, and with the characteristic colic are often the precursors of the more serious nervous lesions. The history of exposure is an all important aid to the diagnosis.

**The Doctor—Old and New.**—"It ain't so much what you know, as what people think you know that counts," said the old Doctor, as he tilted his chair against the shady side of the piazza and stretched his long legs comfortably across the rail. "Now, I've been in practice over forty years and naturally I've learned some things, but when I read some of these journal articles about things I never heard of, I feel as if I knew less every day. And," he added, after a moment's thought, "I don't know but I'm glad of it. There is such a thing as knowing too much. Now there was Doctor M. He was so blamed scientific, he forgot what he was sent for. I remember he was called to see an old patient of mine who had the worst kind of biliary colic, and the first thing he had to do was to get a history and write it down so he could report it to some paper. 'How old are you?' said he, 'Say, Doc,' cried the man, 'Don't mind my age! I've got a devil of a belly ache that's troubling me mostly now.' But he insisted that for a proper diagnosis he must know all about the attacks, and so, while the man grunted and swore, he kept asking and writing down how many attacks he had had, how long they lasted and what they followed. Then he began to ask if his father had such attacks and then his grandfather, till the man yelled out, 'Say, my grandfather is dead. It's me that's got the belly ache!' He never made much of a hit with that family, but he did know a lot. "He went once about nine miles into the country," continued the Doctor, now in a reminiscent mood, "to see a man with the diar-

rhea, and what do you think he gave him? A prescription, and the nearest drug store nine miles away, and it was raining, too! It takes more than book learning to be a success as a doctor. He needs a lot of common horse-sense, and in all this chatter about higher education and a new curriculum—which is one way of freezing out competition in the medical college trust—I haven't seen mentioned any Professor of Common Sense.

"Why, I knew a man in college who knew Gray's Anatomy backward, but who starved to death in Maine, and there are men nearer home who go around completely overlooking ordinary causes of disease trying to find one of those rare ones they read about, and before they make up their minds, nature effects a cure, and if they have not been fired, they get the credit of it. Like the woman Mark Twain tells about with a boil on her bottom. Every physician she consulted wanted to open it, but she dreaded an operation and so finally went to a Christian Scientist. Going up his steps she slipped on a piece of soap and sat down so hard she broke the boil herself, and ever afterward she was a Scientist.

"Just now there seems to be a craze for operations, and the average patient with a choice between an operation and a dose of medicine seems to prefer the former. Down at the Hill the other day a lot of women were discussing appendicitis, and their idea of it was confined to the price of the operation and the length of the scar, and the one with the longest scar got the most for her money. I think it averaged about fifty dollars an inch.

"There was a time," he continued, "when the family physician was of some importance and his opinions respected. His patients, if taken ill, sent for him and waited till he was able to come. His advice was followed and he had no thought of competition. Now the obligation is all on the other side; the doctor promises for instance, to take care of a confinement and sacrifices two months of possible vacation waiting, for his case, and then at the critical moment, because he will be delayed a half-hour, another physician is called, with no thought of obligation to the first.

"In the same way, although you have attended a family for years and waited quite as long for remuneration, when Johnny gets the colic and suffers all day, when night comes you are sent for, and because you can't find your collar, when you arrive at the bedside you find another doctor. They couldn't wait, Johnny was suffering so terribly.

"If the doctors would quit squabbling amongst themselves and get together, they might better their lot and ease their labors, but, as Sherman said, 'War is Hell.' He died before expressing his opinion of the practice of medicine, but I tell you"—"Doctor, come to supper," cried his good wife, and he went.—Editorial. *Providence Med. Jour.*, Sept., 1914.

**Prognosis.**—W. Hale White (*London Lancet*, July 18, 1914), quotes Hippocrates who said: "The best physician is the one who is able to establish a prognosis." In tuberculosis anorexia, vomiting, and diarrhea are very bad signs, especially if persistent; indeed, loss of weight from any cause is bad. A persistently rapid pulse, continued pyrexia, and frequent profuse sweats are all bad, but it is surprising how some of these symptoms may persist for a long time, and yet return to normal. In heart disease, generally speaking, the louder the murmur the better, for it means that owing to the vigor of the cardiac muscle the blood is being sent forcibly through the diseased valve. An irregular pulse is not so often of bad prognostic significance as a rapid one. In lobar pneumonia a most important circumstance is the age of the patient. Pneumonia is chiefly fatal by the action of the toxin on the heart; a very rapid feeble pulse of poor volume is always very serious. If sufferers from pneumonia sleep badly, they do as a rule badly, and if they sweat much apart from the crisis they do badly, probably because the sweating indicates severe infection. An important circumstance in the prognosis of chronic interstitial nephritis is the age of the patient. Young subjects with chronic granular kidney rarely if ever do well, and almost anyone under 30 who has it will soon die. The sufferer from this disease who complains of general weakness does badly, so does the patient who is thin and pale, and if a patient takes to bed because of weakness he will not live long. In cerebral hemorrhage the following point to a fatal result: (a) Coma still present at the end of 24 hours; (b) Cheyne-Stokes breathing as a result of the hemorrhage; (c) much mucus in the lungs; (d) paralysis of all four limbs; (e) a very low temperature; and (f) a very high temperature. Diabetes is a disease of great interest from the viewpoint of prognosis. In the first place it is a racial disease, being terribly common among the natives of India; it is commoner in Jews than in Christians. Quite apart from race, however, it is a family disease. The most important thing about the prognosis of diabetes is the effect of treatment; it is possible to know beforehand whether a patient is going to respond easily to this. The other important thing is whether the sufferer is going to live in easy and comfortable circumstances. One cannot possibly tell whether a treatment is good or bad unless one knows what the natural course of the disease is. A study of life insurance statistics clearly shows that the mortality from any disease increases in proportion as the abdominal girth of the patient over that of the expanded chest increases. It is well known that overindulgence in alcohol greatly damages the prognosis in any disease. Lastly, there is the mental factor: every doctor dislikes the patient with an acute illness who is sure he will die, and likes the patient who is certain he will recover.

# American Medicine

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PUBLISHED MONTHLY BY THE AMERICAN MEDICAL PUBLISHING COMPANY.

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Complete Series, Vol. XX, No. 11.  
New Series, Vol. IX, No. 11.

NOVEMBER, 1914.

\$1.00

YEARLY  
in advance.

**The Siberians' eugenic experiment** is receiving more or less comment nowadays. The present population of Siberia, omitting the long established Mongol tribes, is largely composed of descendants of exiles from Europe. Most of them were moral delinquents, but very many were political offenders—men who were thinkers in advance of their time and whose plans for social reform did not meet the approval of the great majority of their fellow citizens. It must be remembered that the average Russian is perfectly satisfied with his government—only a very small percentage wish a change. The people have given vast power to the autocracy but are taking it back and can get all when they want it. We began by giving very little to our government, but are constantly increasing its powers. The reformers in each nation are looked upon with considerable misgiving for we guard our recently written constitution as jealously as they guard their ancient unwritten one. Abuse of authority is not as common as malcontents imply. There is nothing remarkable then in the eastern custom of exiling the thinking men as dangerous. The point of interest is in the fact that so few intellectual achievements have come out of Siberia. Heredity has not transmitted this intellectuality and we can only conclude that the mental traits

which ruined the ancestors were something in the nature of abnormality—and non-transmissible like genius in general. Perhaps the more intelligent descendants returned to Russia. It is said that from 1658 to 1900 the exiles numbered from 2,000 to 20,000 annually, several hundred times more than our total colonial immigration many of whom were convicts, and few men of genius; yet the descendants of these types from northwest Europe have astonished the world by their achievements. They were of another race. The most interesting point in the Asiatic colonization is the fact that the severity of the cold environment killed off the frail and weak, leaving procreation to the most robust. As a result, the Siberian regiments now at the front are described as tall, hardy magnificent specimens of physical humanity, though of stolid, low mentality. On the opposite extreme, our warm climates have caused such deterioration that the colonial types, though still the intellectual leaders, are so physically deteriorated, that not a few are predicting eventual extinction.

**The eugenic aspect of war** is bound to receive more intelligent consideration than that given to it in recent years by Dr. David Star Jordan. He has been persistently promulgating the theory that war always

kills the best we breed, and leaves the procreation to the weaklings who cannot go to war. He ever asserts that the decay of the Roman Empire was thus caused, though anthropologists proved a half century ago that the ancient Romans were tall blond north-men who died out from climatic unfitness long before the system they created had led to perpetual wars. Moreover in the most warlike period of Rome there were few Romans in the armies, which were largely recruited from the north. Modern war kills only a small percentage of a population and many of them have already done all their procreating. We now hear that the present war is really acting as an eugenic measure and causing an effect the exact opposite of what Dr. Jordan has been so long asserting. It is reported that the fatigues and privations of the campaign are killing off the weaklings. So far, only the most robust young men have survived in some companies. The war has thus far acted exactly like Burbank. He destroyed the unfit and confined procreation to the type he desired. War is confining future procreation to those strong enough to go through the hardships. Bullets make no selection, but kill weak and strong, stupid and bright alike, and have no eugenic or caco-genic effect whatever. Besides all this, men who cannot possibly go to war, are not likely to have large families or any at all perhaps. The birth rate in Europe is so great that the gaps in population have always been repaired in a very few years of peace, and there has been less drain by emigration, less need of importing food and less unemployment. Now we are assured that the gaps will be filled by better material than that destroyed, and that like the Siberians improved by climatic adversity, the future populations will be really better for the

war. We hope all this is true, for like everyone else, we are trying our best to find something good in the present horrors in Europe. It's an ill wind that blows nobody good.

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**Alcohol as a cause of tuberculosis** has been proved so often that it seems almost a waste of time to refer to it. Yet it is necessary to call attention to our besetting sin of carrying every accepted principle to extremes and making it account for phenomena due to other causes. We have long believed that among consumptives over 35 or 40, far more have abused alcohol than in the rest of the population of the same age and social status, but we also know that total abstainers may die of this infection which indeed seems to be worse in the young who have never tasted alcohol. Though the point has not been investigated to our knowledge, it is safe to assume that the great majority of those who die of tuberculosis are total abstainers or have used alcohol in great moderation. We must not assume from such an alleged fact that abstinence is as harmful as overindulgence. Yet some have held such views. The last one to announce conclusions of this sort is Dr. Jacques Bertillon, the statistician of Paris, who has found that the tuberculosis death rate is least in the wine districts of France, and greatest where other beverages induce overindulgence. This sounds almost like an advertisement of French wine, and as much of it is made in America, we suppose some one will now advise the substitution of wine for beer and whiskey to prevent tuberculosis. There must be other factors to account for greater tuberculosis North of the Loire river, but in the absence of exact information, we must accept Ber-

tillon's statement that the disease is greatest where the *per capita* consumption of alcohol is the greatest, no matter what the tipple. Wine bibbers can be just as alcoholic as whiskey sobs or champagne soaks—it is excess which counts. Whether moderation can help or hurt in this regard remains to be proved—opinions are too discrepant to be accepted. It might not be alcohol which helps but the better feeding of those who can afford wine. As for alcohol therapeutically in tuberculosis, so many condemn it and so few praise it, that perhaps it is safest to cut it out.

methods as we had fondly hoped a year or so back. This is all very disheartening and disappointing, but we mention it in the hope that every case will be studied intensively with an idea of finding out what caused the tissue changes, their relation to arterial change, blood pressure, diet, work, infections, alcohol, habits, worry and the host of other things we have had under more or less justified suspicion. In spite of the strong indictment of the colon, remedies directed towards it are in a painful minority. The very profusion of other remedies is a confession of the inadequacy of each.

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**The modern treatment of Bright's disease** is described by Justin Herold of Fordham University in a very readable article (*New York Med. Jour.*, Oct. 10, 1914) but it leaves a distinct impression that the leaders of the profession are far from agreement as to the proper course to pursue. Indeed, the opposing advice almost makes one think that we need not treat it at all. The therapeutic nihilist has the field evidently. The orthodox therapy shows that we are so far from understanding the cause of the disease that we ought at least to be very chary of basing our management on mere hypotheses. Many of the statements of experts sound like pure dogma and it is therefore high time to have a house-cleaning in this department, so that we can discard the unproved and stick to the few things we really do know to be facts. The relation of poisoning to the disease has been so widely accepted, it seems strange that the standard therapy has been so little modified. Symptomatic treatment of course cannot vary, as we know that certain drugs have certain effects, but the removal of the causes does not seem to enter as largely into our

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**The necessity for liberal feeding in typhoid fever** has been mentioned so often and by so many therapists that it comes somewhat of a surprise to hear that it is not practiced by many physicians who stick to the methods which were advocated fifty years ago. There would be some excuse for this conservatism if any observers had published facts showing that there was some harm in keeping up a patient's nutrition, but as far as we know no such articles have appeared in current medical literature. On the contrary the facts seem all the other way, and until they are refuted we must accept the evidence that not only is the diarrhea less, tympanites absent, the disease milder and shorter, and the death rate much lower, but each case comes through the fever in so much better condition that he is able to resist the later complications which make so many convalescents semi-invalids for many years if not for life. Those who still insist upon a low diet for a typhoid patient should think of what would happen to a healthy man if he were put to bed for four weeks and fed upon turpentine, worthless soups, beef tea and

a few cups of skimmed milk. The lack of exercise alone would weaken him to the danger point. The distended tympanitic abdomen is seen in the pure starvation of famines, and is rare in the typhoids who are properly fed. Undernutrition is known to be the underlying cause of much of the world's tuberculosis, and it is possibly the reason why so many typhoids run into tuberculosis. There is a dread of injuring the intestinal ulcers by solid foods but that is no reason for abstaining as the diet can be well pulverized or softened beforehand. Besides, milk when given improperly not infrequently curdles and is really like a solid. The ulceration with its complications of perforation of a blood-vessel or the peritoneum is really due to the intensity of the poisoning and intensity of the inflammation which shuts off the local blood supply. Food is not responsible, but lack of food might make them worse. There are cases of perforation or hemorrhage following atrocious indiscretions of diet, but that is no excuse for withholding a liberal amount of proper articles. There is more than a suspicion that "walking" cases keep up because they feed, and it is a fact that when they do take to bed on starvation diet they become rapidly worse. Let us think of all these things and then study again the articles describing the benefits of a liberal diet of such foods as can be digested by a bed ridden man. Remember that a certain percentage of typhoids are destined to be soon under a forced diet to check a tuberculosis, so let us begin the liberal diet early to prevent the tuberculosis from taking on activity. If only half is true of what has been published as to the wonderful results of high calorie feeding of typhoids chiefly by Warren Coleman (*Amer. Jour. Med. Sciences*, Jan., 1912) we have no hesitation in saying that the time is not far off when a physician will

be held to account if he starves a typhoid to death. Liberal feeding can be carried to excess of course and do great harm, but the risk does not seem to be as great as in the starvation diet of our fathers.

**The alleged impairment of digestion during fever** is such an accepted dogma that it may seem dangerous to challenge it. Nevertheless the medical world is full of firebrands and iconoclasts who have the audacity to be skeptical as to the truth of theories based on the observations of the pre-scientific days of medicine when no one could properly interpret the known facts. In a most excellent article on the treatment of typhoid fever (*Interstate Medical Journal*, May, 1913) O. H. Brown of St. Louis mentioned many physicians who had proved that "the average typhoid patient absorbs food from his intestine almost as completely as does the health individual." The available data indicate that the average reduction is not more than 5 or 10 per cent, and perhaps this could be largely accounted for by the enforced idleness, not the fever. There is then no justification for the fear that digestion would be overtaxed by a diet liberal enough to prevent tissue destruction from starvation. If a healthy average young man loses one quarter of his weight from insufficient food, he is in a very dangerous condition, and might die of lack of nutrition alone. Yet somehow our fear of overfeeding has completely blinded us to the greater dangers of a similar starvation of a typhoid who has the added burden of an infection. It seems now proved that it is not necessary to give large quantities of nitrogen to save the destruction of tissue protein, as carbohydrates and fats accomplish this end. The carbohydrates alone will save our tissue fat from combustion and fats will save the cell protoplasm, and both fats and

carbohydrates can be given in highly digestible forms, the best seeming to be preparations of cream and milk sugar. The patients can and do digest and absorb amounts which would not have been believed possible a few short years ago. The dread of overfeeding the sick should be directed against articles of diet which are difficult for a normal person, and those proteins whose end products are toxic. There is a danger here, for it is quite likely that the kidneys are being injured by the typhoid toxins and are in no condition for further insult. In addition they may be unable to eliminate nitrogen compounds which are normally taken out harmlessly but which now accumulate and add dangerously to the general poisoning. Still there is no excuse for reducing nitrogen foods below the body needs, and we must give at least as much as it wastes physiologically. An occasional report of good results of liberality in nitrogen feeding proves that our fears of overtaxing digestion may be exaggerated even in this class. Alcohol has been so thoroughly condemned as a food for fever patients that it is like risking one's professional reputation to advocate it, yet as this is a time of universal skepticism we would not be surprised to hear of some one saying a good word for a very moderate amount of this readily oxydized carbohydrate for a condition needing much of this class of foods.

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The crusade against "carriers" of infection is modifying our ideas as to sanitation. Dr. Alvah H. Doty summarizes the present status of the matter in an important article in the *New York Medical Record* (Oct. 17, 1914). He emphasizes the accepted facts that such diseases as typhoid are transmitted by infectious discharges which must be disinfected, but shows that

the usually employed methods are not efficient. Heat is recommended as the only sure means. Perhaps we can never expect all such discharges to be sterilized, so we are forced to protect food and water supplies from contamination. On the other hand Doty strongly asserts that in the group of diseases called contagious, more or less close contact is necessary for the transfer of the infection from the carrier to the healthy. The germs seem to be so easily killed that they cannot survive on the surface of rooms, furniture and clothing. His experiments with sulphur dioxide and formaldehyde have convinced him that they do not disinfect even when used with all care, and they might as well be omitted. Similarly the fear of contracting disease from money or library books is declared to be lacking in any foundation in fact. He believes that we have sufficient evidence to abandon room disinfection after measles, diphtheria and scarlet fever, but states that it would not be politic for the family physician to take the responsibility. If a convalescent should give the disease to another inmate of the house, it would be blamed on the doctor for omitting disinfection. Hence no action can be taken until we have positively proved that such infections are generally transmitted from person to person. The initiative must be taken by the health authorities and they are doing this in many parts of this country. Doty wisely suggests that we go slowly in this direction. We have called attention to the fact that we are not yet absolutely certain as to the harmlessness of the desquamated skin in measles and scarlet fever, yet Doty says there is no proof that it is infectious. He says that even in smallpox he is convinced that fomites have nothing to do with transmitting it. Still, until we are sure perhaps it is wisest to use disinfectants even if we do

waste them. Our present duty is to talk to laymen, day in and day out, that the chief danger is the sick person, the convalescent or the carrier, that modern sanitation is directed against them, and that we would drop terminal disinfection if it could be absolutely proven that it is useless. As usually done, room disinfection is entirely useless and we are committing a grave error in not doing it efficiently, if at all.

may carry it to man, children being more susceptible than adults. The germs are said to remain alive on roads, in barns and even in hay or straw. There may be legitimate doubt as to the reality of these fomites, since from a half to three-quarters of those exposed to infection escape, as though more or less direct contact were necessary to transfer the germs from the sick to the well; but it would be folly to neglect radical disinfection until we find the germ and learn exactly how it is carried.

Vigorous steps are being taken by the Agricultural Department which can be depended upon to do the right thing to end the epizootic; providing the farmers will not conceal mild cases which usually recover after a short period of fever, and emaciation. The blisters in the mouth are so painful as to interfere with eating for awhile, but if they involve the bronchi and intestines death generally results, probably from toxemia. In sheep and swine the lesions of the feet seem to be the worst. The world is waiting for some genius to specialize upon this group of diseases and then find a way of seeing the causes. We can get millions of government money to study this plague but not a cent to study smallpox, so let us solve our puzzle by means of the discovery of the germ of foot and mouth disease. Ross cleared up many points as to human malaria by working with that of pigeons. There might be a silver lining to this cloud after all, if we will only put our adversities to use. We would like to suggest that possibly some wild animal is tolerant to this germ, as in the case of plague and trypanosomiasis, and acts as a reservoir from which the germ occasionally floods over to domestic stock. This has been suggested as to yellow fever and mon-

**Foot and mouth disease of cattle** has suddenly spread over many parts of the country from some focus where it has been latent. Naturally, there is considerable public alarm, not so much from the rare accident of its transfer to man, but from the great reduction in the meat and milk supply which must result here and there where herds are partly or entirely destroyed to check the further spread of the epizootic. At present only a minute fraction of the cattle of the country are infected, and if these are promptly destroyed and there is a proper supervision of the transportation of all others, it may be possible to protect the uninfected and prevent any further rise in the cost of living. The cause is no more mysterious than the numerous other infections which cause lesions of the skin and mucous membranes—smallpox, measles, scarlet fever, and possibly sprue, pellagra and scurvy. There seem to be a number of such diseases which afflict lower animals. Perhaps all of these germs are ultra-microscopic, and some, if not all, will pass through filters. To live all must be kept cool and dark. Foot and mouth virus will retain vitality for months but is killed by drying and by various disinfectants properly applied to it. Milk, butter and cheese

keys. It is another reason why we should pay more attention to the diseases of wild animals. Again we would appeal to those who have more money than they need.

**The Boston School for Health Officers** graduated its first class last June. An article describing the course of instruction and the general subject of public health education was published in *Science*, Oct. 23, 1914, by Professor Geo. C. Whipple of Harvard, and it should be read by every publicist in the land, as it is time for other cities to wake up and get to work on the same problem, New York especially which has done nothing beyond some uncoordinated lectures. In the first place, physicians must disabuse their minds of the false idea that practitioners of medicine are the only ones fit to be sanitarians. The amount of time and labor spent in learning how to cure disease, leaves the student practically no time to learn the practical means of prevention. Of course every physician as well as every layman knows that to prevent typhoid, for instance, we must prevent the germs travelling from the sick to the well. The practical ways of doing this, include the protection of foods and water supplies, disposal of wastes, quarantine of convalescents or carriers, and other matters each of which is almost a specialty of itself. The practitioner who devotes every hour of the day to curing the people sickened by bad sanitation, has not time to do more than acquire the bare rudiments of prevention, and cannot know enough of it to be a safe adviser for the community, let alone specialize on any of sanitation's numerous subdivisions. The new plan is to excuse the student from all courses which are designed for practitioners of medicine, such as surgery and therapy,

and give him only enough of the fundamentals of anatomy and physiology to understand the diseases he must prevent; sanitary engineering and the causes of communicable diseases are the things in which he is to specialize and they take up most of his time, together with administration and statistics. A bachelor of science will not take any longer to fit himself for public health work, than a graduate in medicine who has not obtained that degree. The degree conferred is "certificate in public health," the doctorate being conferred by Harvard only for a far greater body of work.

**Reorganization of State and Municipal Health Services** is a crying need which Prof. Whipple incidentally mentions. The future health officer will necessarily have no income except his salary which must be large enough to support him and to attract the grade of men demanded by this important work. Small communities cannot afford to pay a man to keep them healthy—at least they short sightedly claim they cannot. It is said that the average monthly salary of health officers in New York is sixty-nine dollars, or thereabouts, and perhaps many of them are overpaid for the amount of work they do. Villages prefer to get sick and pay more to doctors for cure, or do without help for economy's sake. But this must be said in favor of those who hold the purse strings—they are more than liberal whenever convinced of the need. A little sensible advisory talk now and then is what they ask. Professor Whipple mentions the successful plan of several small adjoining villages or cities combining to employ the same sanitary adviser and executive. Unfortunately the medical profession looks on the salary of the local job as their per-

sonal property, whether they are fit for the work or not. They have fixed the law so that one of them shall get the pay, but have done nothing to see that the public gets the right man. New York State's new sanitary districts, each with a supervisor, may be a step in the direction of abolishing the local offices or at least some of them. A man with an automobile can cover the field of a half dozen or more communities, if he has the ability to make the clerks do the trivial routine now expected of him. Adjoining communities infect each other and are sadly in need of cooperation. The whole subject of public health administration is now undergoing serious study everywhere and we can confidently predict revolutionary changes and very great prolongation of efficiency and life. We want more articles like Whipple's.

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**The alleged prolongation of life by matrimony** has always been taken humorously but if it is true it is a rather serious medical fact of more than ordinary scientific importance. It is said that the vital statistics of Chicago show that the death rate of bachelors is about thirty percent higher than that of husbands, and that maids have a forty percent higher rate than wives. On the fact of such statistics insurance companies should reduce the premiums on the policies of married people or raise the rates on the unmarried, but there are other factors which may render the figures worthless for any deduction as to the hygienic value of marriage. It is no doubt true that the assumption of family responsibilities has a salutary sobering effect upon young people who abandon harmful habits and frivolities of youth, but it is difficult to believe that "wild oats" could cause so much mortality

at such early ages, for we must assume that the average age of bachelors is far less than that of married men. Besides, women do not sow wild oats as a rule. It is more reasonable to impute the difference to the fact that disease or abnormal development keeps from matrimony a large number of people doomed to early death. The married state is generally assumed to be the normal, and perhaps it is by the ordinary laws of selection and survival of the fittest. It is drawing a rather broad generalization to state that all those who enjoy single blessedness are abnormal in some respect, yet something has thrown them into the class which takes no part in keeping the species in existence. This of itself might be competent to explain the higher death rates of the unmarried. Weddings are generally postponed for ill-health or even abandoned, and it is safe to say that couples who have weathered all the storms of infancy and youth are a selected class with a much greater life expectancy than those whom Cupid has passed by. Perpetuation of the species is left to the fittest after all, and nature has an infinite variety of ways of determining who are the fittest. Man cannot be an exception to natural law. Of course those who are not the fittest to keep the race going, do have offspring but such lines run out in competition with those better fitted for the struggle. Nevertheless, the statistics might prove that a normal married life does promote health and increase our years. We hope so at least. Whether the married state can restore lost health is another question, except in a few conditions remedied by a pregnancy. Indeed the new burdens may be an added load which will act like the final straw to break the back of resistance. As physicians then, we should be very careful as to recommending marriage when this

question is put to us professionally. Its benefits are for the fit not the unfit, and even if we do believe it lengthens the lives of the fit, it might shorten the rest and also render them not worth the living.

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**The pathological affinities of beriberi and scurvy** were described by S. T. Darling (*Jour. Amer. Med. Ass'n.*, Oct. 24, 1914), who based his paper largely upon the generalization of Frank to the effect that five groups of lesions and symptoms result from a diet deficient in vitamins. These are nervous, cardiac, effusions into serous cavities and the scorbutic and pallagric syndromes. The interesting point brought out is that these two diseases and probably rickets are the results of the same cause,—the long use of a diet defective in some essential ingredient. He states that the evidence as to the infectious nature of scurvy has, upon later analysis in South African mine workers, caused a reversal of opinion and the disease is again thought to be purely dietetic in origin. Of course such a sufferer is more susceptible to infection and might prevent mouth lesions by extra care in the way of cleanliness as already proved in the Rand, yet nevertheless he may really have scurvy which will show itself in other ways. The splendid results in preventing beriberi by the use of unpolished rice have not convinced certain tropical experts that bad diet is the whole cause, but merely furnishes the condition in which the germ will thrive. Curiously enough, even tuberculosis, which is the bane of the underfed, may in this one respect be grouped with these dietary diseases, though there are a thousand other things which may render our tissues good food for these bacilli. Perhaps then we

might be safe in saying that defective or excessive nutrition is at the basis of many of our ills if not most of them, and that the properly fed will resist cancer or any other process. That is, the dietary prevention or cure of any of these diseases is not proof of their non-infectiousness but merely proof that the well fed are immune.

**The dietetic basis of pellagra** has been reported by the Commission of the Public Health Service which has been investigating this new American plague. (*Bulletin*, Sept. 11 and Oct. 23, 1914). They found that in practically all the cases investigated, the food had been deficient in nitrogen. If the sole treatment was a diet in which nitrogen was in excess, there was improvement in fifty percent, cure in fifteen percent, while the rest died or were unchanged. Cooper of the Mississippi Board of Health reported marked improvement in every case so fed, and complete cure in the majority. Similar treatment arrests or cures tuberculosis. This might explain the reason for the greater prevalence of both diseases in the "untidy" class of the insane, who are difficult to feed and who are frequently underfed through refusal to eat at all. Still, one might ask why pellagra was not prevalent in this class of cases many years ago, and is not found outside of the ever widening pellagra zone now in the underfed. Against the idea of infection the Commission places the fact that the better fed attendants in institutions where pellagra prevails, are not affected though in close contact with the sufferers. Attendants in sanitaria rarely become actively tubercular, but that fact does not disprove the infectious nature of consumption. The spoiled-maize theory so widely accepted in Europe might be a half truth after all, not that the maize

did it, but that the diet was defective. The theory was dropped when we found cases which never used maize. It remains to be seen whether nitrogen starvation merely puts the system in a susceptible condition, and whether there is not a living cause after all—a parasite which was recently brought to America by immigrant hordes from the European pellagra areas. The prominence of the lesions of the whole digestive tract in scurvy, pellagra and sprue certainly warrants us in reopening the case of the last mentioned with a view of determining whether it too is not based on defective nutrition. It is generally looked upon as an infection and one writer has suggested a protozoan an account of certain alleged affinities to other protozoal diseases, (W. Carnegie Brown) but it too is cured by either a nitrogenous diet or a fruit diet. It is noteworthy that both sprue and pellagra flourish in places where insect life could account for the transfer of an infection, but not in dry arid countries. The skin eruption of pellagra is thought by some to be an effect of light on the susceptible skin, but such eruptions are not found in the underfed elsewhere, even in lands of intense sunshine. A special dietetic or microbic poison therefore seems to be the cause of this sensitivity. Virchow and others long ago noticed that in the pellagrous condition of animals fed on buckwheat the disease was prevented by confinement in the dark, and many have reported that the human exanthems are made worse by much light and benefited by the dark. That is, the evidence in pellagra is so far inconclusive as to its cause, though it seems to point to an infection. Samson has proposed this view and so well defended it, that it will require much counter evidence to disprove it.

**The susceptibility of the improperly nourished** seems to be the great lesson these new investigations are imparting to us. This is such an old story that it sounds like going back to the childhood of medicine, but it is a wholesome reaction against the bacteriophobia into which we drifted when we found the determining causes of infections. Have we not imputed too much power to these invaders? Are not most of them more or less harmless to him who lives a Godly, upright and sober life, who is properly fed and never underfed or overfed? The phthisiographers are hinting around in that direction, more or less openly confessing that we need not fear the consumptive. Well fed Europeans in the tropics seem to escape leprosy and other diseases which decimate the half starved natives. There are of course certain infections like smallpox, typhoid and the diseases of infancy and childhood which apparently attack all alike, though they are more fatal in the frail and starved. There is then no reason to let up on the present sanitary campaign against carriers, but there is plenty of reason to emphasize and enlarge the crusade for better individual hygiene, particularly better diet. We were so dazzled by the brilliancy of the light thrown by modern bacteriology that for a time we lost sight of the normal natural resistance and how they are produced. The toxemic causes of arterial and nephritic changes might reasonably be traced back to diet. The colon might not be so bad if it had no toxins to absorb. In other words the trend of etiologic thought is towards the chemistry of the body. It is safe to predict an enormous field for scientific dietetics in place of the nonsense which has masqueraded in that disguise.



## MEN AND THINGS



The report of the Committee in charge of the American Fund for Belgian Physicians which appears elsewhere in this issue will be particularly interesting to all who are in sympathy with this undertaking. It will be seen that the response was immediate following the appearance of last month's issue, and we have been much gratified by the goodly number, considering the short period covered, who have answered our appeal. There are so many drafts on the resources of all of us that the collection of a large sum is not to be expected. A great many have already contributed to other funds and have done all that they feel that they can do, in justice to themselves. This is the tenor of many letters received, applauding and approving this movement for Belgian physicians and promising later contributions. However, as the active aid of our contemporaries begins to bear fruit this medical fund will go steadily forward, and before Christmas we will doubtless be able to forward an additional sum to our afflicted colleagues. Already a substantial check has gone forward. It seemed wiser to do this than to wait until the Fund reached larger proportions, for private information which has been received has shown the needs of many of our Belgian confrères to be so urgent that every possible dollar is needed now. One correspondent tells how bravely the doctors are doing their best to alleviate the suffering of their people, but going about their work without sufficient clothing, in some instances without shoes, and always without food enough to keep their strength and vitality up to what it should be to enable them to pursue their labors and withstand the cold. Unless relief of a substantial character is forthcoming in the very near future to these overworked, underclad and under nourished doctors, privation and disease will soon take a toll from their ranks

that will stagger humanity. We who fortunately are living under peaceful conditions cannot grasp the tragedy that has come into the lives of our Belgian brothers. We can only partly comprehend the awful havoc war has wrought throughout a land that only a few months ago was happy and prosperous, with all classes of its people enjoying the advantages of a highly organized civilization. Suddenly the blow fell and in a few weeks system and organization were completely wiped out. Chaos reigns and the whole Belgian people from the highest to the lowest have become destitute and poverty stricken. With the collapse of their whole social organism the entire population became helpless, with famine, cold and disease encompassing them. The outside world must come to the aid of these suffering ones, and we who know the special problems of medical men must lose no time in extending a helping hand directly to the physicians of this sorrow-stricken country. Not much is asked from each individual but every one who realizes something of what our brethren are undergoing and who in consequence find their heart throbbing in sympathy, is invited to join this movement which in its aggregate may carry untold cheer, comfort and courage to those whose needs may otherwise be the last to receive consideration.

The proteomorphic theory of immunity which Drs. H. S. Williams and J. W. Beveridge have presented in their masterly article appearing in this and our preceding issue has attracted much attention from scientific workers generally. It is hardly appropriate for us to discuss the details of this theory until those better qualified have considered it carefully and comprehensively.

ly, and passed upon its merits. We do not hesitate, however, to commend the scholarly and scientific character of this valuable contribution to scientific literature. Without intending to make any invidious comparisons, or to depreciate in any way other recent papers on this extremely important topic, we nevertheless feel that this article by Drs. Williams and Beveridge is going to stand for a long time as a beacon light in the literature of the subject. The enormous amount of work and study which the authors have given to their investigation of immunity is abundantly shown in their paper, and this of itself alone would insure them a respectful hearing. But in addition their discussion of every detail and phase of the various physiologic phenomena described is so comprehensive and rational that it cannot fail to receive the consideration of every reader who has the slightest interest in the problem. It is too early to foretell the extent to which this latest theory of immunity will supersede its predecessors, but its simple, common sense character will certainly make it appeal to many as an eminently rational and practical explanation of the phenomena which are concerned in the production of immunity. This fine piece of original research work in a field that has been extensively cultivated is especially interesting in view of the complaint often made by young physicians that medicine holds no opportunity for original study or discovery, that the medical field has been exhausted and no brilliant achievement is possible. The investigations and studies which Drs. Williams and Beveridge have been engaged in for several years and which have culminated in this new theory on immunity furnish pretty conclusive refutation of such complaints. Other achievements no less brilliant than this leading up to the elaboration of the proteomorphic theory of immunity doubtless remain for men who have the requisite ability and "the will to do."

regeneration—on official lines—for no matter how hard we try to be good we utterly fail to please such immaculate souls as the editor of the *Journal of the American Medical Association*,—men who are born good and who do good works with such slight effort that they really deserve as little credit for it as George Washington for truthfulness, as he couldn't tell a fib even if he wished to. There is perhaps no form of wickedness into which we would not sink were it not for these splendid guardians of medical morals. Of course owing to a more than ordinarily careful training in early life we have not found it difficult to keep from committing murder, even of the unborn, nor have we ever adopted the ways of the advertising charlatan, guaranteeing cures to the incurable: indeed, under no circumstances would we remain silent under such accusations, or the charge for instance, that our diploma from our Alma Mater was obtained in other than an honest, above board manner; but there is no telling what proprietary remedy we might openly try even though endorsed by an authority no better qualified to pass on the therapeutic value of a product than the editor of the *Journal of the American Medical Association*!

We tremble at the consequences of this glimpse into our souls, but we must make some kind of an excuse or defense for our latest alleged lapse from virtue. We have tried so hard to keep untruthful advertisements from our pages, and indeed have rejected so many every year, that we are creating a reputation of being finical. Yet all this has been "love's labor lost," for we are shocked to learn from a recent issue of the above journal, that we really advertise nostrums! This is awful, but we have hopes that in the final judgment the recording angel will give us more credit for good intentions than our accusers have, and make some allowances for the fact that we have lived clean, decent lives, that we have never borne false witness against any man, that we have always credited our fellowmen with motives as sincere and honorable as our own, that our domestic relations have been free from scandal, that we have never intentionally injured any one, and finally, that if we have made mistakes, they have been due to genuine errors of knowledge—or judgment.

**The awful depravity of independent medical journals** is such an accepted fact—in Chicago officialdom—that we are not divulging any secret to confess that by such standards we know we are bad—very bad. It must be original sin which prevents our



Of all those in Belgium to whom the ruthless hand of war has brought disorder, destitution and dismay, no class has suffered more than the doctors; for as some one has said, besides the general suffering in which they share, the nature of their calling has led to their being looked to for a large amount of work, which they have cheerfully performed, but often alas, while hungry and cold.

**What is a Nostrum?** Worcester said that originally the word had the literal meaning of the Latin *noster, nostrum*, ours, and referred to quack medicines retained for profit in the hands of the discoverer or his assignee, a patent medicine or arcanum; and Dunglison said that an arcanum (secret or mystery) was any recipe or preparation reported to possess great efficacy, whose composition is kept secret. Nostrums, then, may be good medicine or criminal frauds. Medical men were once willing to prescribe remedies of whose composition they were ignorant—some physicians do it yet,—but on account of the obvious evils, we and other reputable journals have so long insisted upon knowing the active ingredients or pharmacologic character of pharmaceutical products that arcana have disappeared from legitimate practice. Nostrums are still with us and will be as long as present laws permit proprietorship of trade marks and patents; but notice this, *the idea of secrecy has gone.* If there is any physician who does not know all that he should know concerning any product he is using, or that is seeking his patronage, *it is his own fault alone.*

It begins to look as though the "immaculate editor" were trying either to make the word nostrum respectable, or to injure honest proprietary remedies with an epithet—because they have been given trade names—even though their composition is known. The fact of the matter is that times have changed with the evolution of modern skilled pharmacy which can make better and more uniform preparations than the doctor can devise and the corner druggist compound.

Life is too short and the practitioner is too busy with the great problems of hygiene prophylaxis and sanitation to lose time writing out prescriptions when a single word or name will bring something better, with definite responsibility back of it. This demand is world wide for it is in accord with modern needs. The actual name is immaterial but it is usually derived from the use or composition, like the word chloral for instance or iodoform or any of the dozens of other synthetics in common use. The profession demands knowledge of these and if they cannot get it from the official journals they must refer to the unofficial who thus become the leaders, showing the way for the orthodox to follow.

**The ethics of medical advertising** must always be changing for our needs change with the increasing exactness of scientific medicine. What was allowable in the days of mysticism is now inethical, and what was wrong before the days of scientific pharmacy, when drugs were compounded wholesale by quacks only, is now a necessity. We have long had a rule to cut out the extravagant claims of proprietors of brands, and instead of receiving approval, we are condemned by the immaculate one, bless his pure heart, because we allow the owner of the goods to say it is "an efficient remedy." At the same time, he himself prints an advertisement of a nostrum or trade marked brand of an article and sanctions the statement that it is a "dependable remedy in the treatment of many intractable lesions," meaning expressly those of specific origin, which are universally known to be incurable without internal treatment. And yet in the aforementioned issue of the Association journal there is a criticism of the advertising ethics of six journals whose popularity and widespread circulation make them attractive advertising mediums for owners of trade marked brands of remedies, as well as of all other products used by progressive physicians. It would seem that medical men realize that it is the independent journals that supply the profession with information wanted, especially along therapeutic lines, and much of which for one reason or another is excluded from the official journal. The editors of one of the criticized journals are professors of therapeutics and surgery in two of America's foremost colleges, and the medical profession evidently considers the ethical and scientific opinions of these leaders as more nearly correct than those of the "immaculate one." There are so many errors, unwarranted conclusions and malicious innuendoes in the above mentioned article, that the profession must be warned not to accept the unverified statements of the *Journal of the American Medical Association* on any topic nor to be deceived by its narrow illogical attitude towards trade marked preparations of pharmacopeial articles. If the Association desires to carry on such a campaign against progress it should select as its agent or spokesman one who not only has had a large experience in general practice and knows its practical necessities but who has a comprehensive knowledge of modern

scientific pharmacy and therapy. Surely such a leader would not find it necessary to conduct a campaign of personal attack and abuse against those who refuse to accept all of his views. The profession seems to be disgusted with such methods, and may yet call the Association to account. There is a growing resentment against the Council on Pharmacy and Chemistry for its erroneous views on vaccine therapy—matters entirely beyond the sphere of pharmacists and chemists, and if it is fathoming these new errors it may lose caste entirely and cause the really excellent work it has done in its proper sphere to be overlooked.

The propaganda for reform inaugurated several years ago by the *J. A. M. A.* would have commanded infinitely more respect if the methods employed had shown a fairer and less vindictive spirit. From the first, however, the personal animosities and jealousies of those in control were allowed full sway, with the result that the real and praiseworthy objects of the movement were lost sight of in the many controversies precipitated and antagonisms created. The authors and directing forces of this campaign promptly divided all mankind into two classes, those who were willing to accept every view, opinion and statement of the propagandists, and those who were not; in other words, those who followed them blindly and those who did not. They seemed incapable of realizing that any physician or medical editor could sympathize with the objects of the movement, and yet honestly disagree with some of the conclusions of its advocates. The slightest difference of opinion or the slightest tendency toward independent thought has meant but one thing to the propagandists, "subsidization by the interests!" Intolerance has characterized their attitude from first to last, and if the movement has failed to accomplish all that it should, the direct cause can be found in the unwillingness or inability of the reformers to see other than venality in those who differ with them.

We, however, on our part would be no less narrow if we failed to acknowledge the good that this campaign has achieved, handicapped though it has been. Indeed, much has been done in pointing out evils, correcting improper customs and establishing definite standards. There are few honest men who will not concede at once that the

pharmaceutical industry was abuse-ridden and that a great and much needed reform has taken place. But in the accomplishment of this reform much unnecessary harm has been done, many needless antagonisms have been created and many statements allowed to go forth that have been unwarranted and untrue. In the attack on real abuses and evils, which honest medical men know they have been as responsible for as the manufacturers, the actual benefits and advantages of meritorious pharmaceuticals have not been properly appreciated. Therefore, in commending the good that has been done we do not hesitate in saying that we believe it would have been far greater if the campaign had been more fortunate in its leadership. There is a legal doctrine to the effect that those who seek relief or redress must come into court with clean hands. The editor of the *J. A. M. A.* should have realized this, for in face of the fact that for years he had aided and abetted the evils that were suddenly so intolerable to him, and owed much of the financial status of his journal to the advertisements henceforth tabooed, his "holier than thou" attitude was more ludicrous than convincing. But aside from this, later events have shown still more conclusively that if the medical journals of the country are to be chastened and "born again" the editor of the *J. A. M. A.* is not the one to undertake the task. That he has not hesitated, however, but has maliciously and mendaciously attacked this and all other journals that have refused to trust to his therapeutic knowledge and teaching, is anything but a testimonial to his good taste and judgment.

We heartily dislike a fight and will go to almost any lengths to avoid a quarrel, but if the editor of the *J. A. M. A.* thinks he can continue making onslaughts on AMERICAN MEDICINE without precipitating war, he is greatly mistaken. And if it becomes necessary to mobilize our forces and mix in the fray, we shall do so without any fear of the outcome. We may not have any 42 centimeter guns, but for the weapons we have there is a goodly supply of thoroughly dependable ammunition.

**The Frank Case in Atlanta, Georgia.—**  
The conviction of Leo M. Frank for murder

and the refusal of the highest state courts to reverse the decision or grant a new trial, have produced a feeling akin to stupefaction in other parts of the country. The lawyers and judges are among the ablest and no doubt the kindest in the world, and might be presumed to give the benefit of the doubt to the accused. Nevertheless the impression grows that a gaudy mistake has been made, and whether this impression is right or wrong it exists and must be explained away or cause a reexamination of the evidence. The case has now become somewhat a psychological study on account of its paradoxical features and should be of interest to all physicians but particularly those interested in medical jurisprudence. Only a few years ago an Atlanta mob startled the world by the indiscriminate slaughter of innocent negroes because many of the vicious ones had been committing assaults upon white women. The sexual proclivities of even the normal negro are thus well known and yet the jury and courts have placed implicit confidence in a negro who is said to be a pervert, who asserts that he is merely an accomplice to the murder of the little girl and who is now accused by his own attorney of being the real murderer and violator. A paper found near the dead body contained superstitious expressions that only a negro would make and yet the jury believed the negro who said that he saw the white man write it. The paper was evidently four years old, yet they believed the negro when he said that he saw the white man tear it off a fresh pad of blank forms. The crime is one which negroes are prone to commit, and if a white man is guilty he generally if not always shows signs of mental disturbance. The accused is said to be perfectly normal mentally, physically and morally, but grossly untrue rumors as to his morality were given the widest circulation. Without the slightest basis of proved facts, even the clergy cried out for his blood—just as in the dark ages they demanded the execution of those accused of witchcraft. The greatest scandal of courts both north and south has been their leniency to accused men on trivial technicalities, yet in this case trivial technicalities have been used against the accused. Also, it is said, vital technicalities have been swept aside even when alleged errors have violated the basic rules of evidence, such as accepting the unsupported

testimony of an accomplice. Juries are always obedient to public opinion—indeed they help to form it—so we must expect acquittal when sympathy goes out to the accused. A Virginia court has decided that a man is warranted in killing those who are rumored to have insulted his daughter, though the rumor may have been started by a villain to encompass the death of an innocent, noble rival. But this does not explain the hatred towards Frank. The whole thing is incomprehensible. If the accused is guilty, northern opinion has been formed from untrue statements, if innocent Georgia is guilty of an action worse than that of the Russians in the Beiliss case. Which is correct? Can the courts be trusted to find the truth? If not, will the Governor dare to defy public opinion and release the accused or commute the sentence to confinement until a time when the public will not be excited by a pardon? A people which becomes hysterical every time the band plays Dixie, cannot be expected to be calm when it comes to a matter of the treatment of a man even suspected of a crime against one of their women. The emotionalism which makes them the most lovable people on earth leads them to excesses of hate also. We wonder what would have happened if Frank had been tried by a jury chosen in another part of the country from cold, unlovable people noted for lack of emotion, but thereby able to weigh the value of testimony and reject the false. Several witnesses, one a clergyman, have made affidavits in favor of Frank and have later made second affidavits that their first were false. Some witnesses have repudiated their first testimony against Frank and have later repudiated their repudiation. What's the matter? There is a psychological gold mine for those who can dig it. The case seems destined to be the most unique in the history of our courts. We hold no brief for Frank, but we think that a new trial would remove a blot from our record, for the uncertainty of guilt makes the conviction a national horror. Already there is bitter complaint as to the ease with which the rich murderer Thaw can have his case carried to the supreme court, while even this was denied the poor man Frank on his first application. It is a pity his plea cannot be taken to a court and jury having no affiliations with the people of the locality of the crime.



## THE MECHANISM OF IMMUNIZATION.

BY

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(Continued from October issue).

### THE IMMUNIZING MECHANISM IN OPERATION.

Such, then, is the immunizing mechanism of the body as we conceive it. (1) a system of lymphoid tissues, comprising lymphatics, bone marrow, and spleen, and sending into the field legions of leucocytes and still greater legions of red corpuscles to support them; (2) body-cells of many types standing in the background, each equipped only for individual defense; and (3) the liver as the chief excretory organ of the by-products of the conflict. This is the system which guards the body from within, as skin and mucous membrane guard it from without, against the intrusion of foreign proteins of every type, and against the products of proteid activity.

Some further details as to manner of working of this important mechanism may perhaps be presented to best advantage if we make inquiry as to precisely what takes place on the various occasions when the efficacy of the defensive mechanism is put to an exceptional and decisive test.

Let us assume a case in which a few molecules of unbroken protoplasm have found their way through the intestinal wall—evading the pepsin and trypsin and erepsin of the digestive tract—and enter the blood stream. This is not a strictly normal occurrence, to be sure, but it must be a very common one, under slightly maladjusted conditions of digestion, as the experiments of Miss Van Alstyne, already cited, show. In these experiments, the proteins proved thus to enter the circulation unbroken including those of egg, albumen, blood serum, and milk. So we may fairly assume that any of the ordinary food proteins may on rather frequent occasions, find their way in small quantities into the blood stream. We have now to inquire what happens to them there.

According to our assumption, the protein is a mere fragment of a normal food stuff; but it is a disturbing element in its present location. According to the theory here presented, what happens to it is this: the leucocytes having had to deal with this particular type of protoplasm many times before have already secreted into the blood serum an enzyme (allied to trypsin) that is capable of attacking the protein and accomplishing the early stages of its proteolysis. This process will be facilitated if the molecules of foreign protoplasm chanced to be engulfed in the body of a leucocyte. But in any event the leucocytic enzymes will hydrolyze the protein to the

peptone stage; conceivably to the stage of polypeptides.

It is not absolutely essential to the theory, but is fully consistent with it, to suppose that at this stage the partially hydrolyzed foreign protein is turned over to the red blood corpuscles. To them these particular polypeptides are familiar materials, since they have dealt with their like often enough before, and the particular department of their enzymes-making apparatus that will deal with these specific polypeptides is in good working order; indeed, the enzymic products are already in the blood stream. So the further hydrolysis of the intruding matter is rapidly carried forward; with the result that presently the main bulk of the material has been transformed into amino-acids—thus supplying normal material for the uses of the cells that are to build up the specific body proteins.

We must suppose, however, that there is a small residual matter, of doubtful constitution, which has not been thus hydrolyzed; for the complete hydrolyzation of a protein through the agency of enzymes has not been accomplished in the laboratory, and we have no reason to suppose that it is accomplished in the body. It requires from two to five hours of digestion in strong hydrochloric acid to hydrolyze protein completely *in vitro*; the organism has no enzymes of corresponding power.

But, according to hypothesis, the residual molecules, whatever their exact nature, have been taken up by the red corpuscles; with the result that the corpuscles themselves are seriously damaged. The residual molecules, that is to say, are poisonous to protoplasm. The red corpuscle in absorbing them is thus injuring itself, but protecting the body-cells that would otherwise absorb the poison.

But whereas such an injury to the body-cells would be highly detrimental to the entire organism, the injury to the red blood corpuscle is not necessarily a matter of consequence. The corpuscle bearing its poison is whirled on in the blood stream until it comes to the liver, and there destroyed, its noxious molecules being discharged, with countless others of similar origin, into the bile duct.

It would be interesting to inquire as to just what is the character of the physiological action that leads to the destruction of the red corpuscle, but this would carry us too far afield.

Conceivably osmotic pressure alone may suffice; the substance of the hemoglobin being in part decompounded by the imbibed foreign enzymes, and its osmotic pressure thus enhanced. Rupture would then be likely to take place in the liver, because that organ serves as a great lagoon in which blood from the portal vein becomes relatively static, and reduced in pressure. Somewhat similar conditions in this regard obtain, it may be added, in the spleen; and it is perhaps significant that many physiologists believe that this organ also is the seat of erythrocytolysis.

In any event, through osmotic or chemical action disruption does occur, and the unassimilable remnant of the foreign proteid is thus extruded into the intestine, whence it originally came; the general protein content of the red corpuscle (transformed now through partial disruption into globulin and albumin) being liberated to make up the regular protein contents of the blood serum.

#### THE PHENOMENA OF ANAPHYLAXIS.

But suppose now that the protein that enters the blood stream; instead of being the product of a familiar foodstuff, had

been a protein of an unusual type—that is to say, one that the organism does not habitually ingest. Or suppose that the protein, although of a familiar type, is introduced in rather large quantities. In either case complications arise; and these complications are precisely similar in character in the two cases, being due in each case to the inadequacy of the protective equipment, as will appear in a moment.

Illustrative cases in point are the laboratory experiments in which a foreign protein is injected into the system of a rabbit or guinea pig; and, in case of a human subject, those instances in which proteids are ingested in great quantity and fail of normal complete digestion.

In either case, the phenomena may result that have become more or less familiar under the name of anaphylaxis. It is a condition of toxicity in which the symptoms clearly indicate involvement of the brain—or, at all events, of the central nervous system.

In the laboratory experiments, this condition of so-called anaphylactic shock, may occur after a single inoculation with a large dose of a foreign proteid; but in that case it is somewhat delayed.

The condition is usually induced by following a small initial dose of protein (which has no apparent effect) with a larger one at an interval of a week or ten days. A strictly comparable condition is sometimes produced in the human subject through the use of antitoxic serums, anaphylaxis being due not to the antitoxin itself, but to the foreign blood serums (usually that of the horse) in which it is suspended. In the case of the animal in the laboratory, the condition is often fatal, sometimes very rapidly so. In the case of the human subject, it may constitute a serious "serum disease."

The current interpretation of this condition is that the first injection of the foreign protein has "sensitized" the tissues, so that when the second injection occurs, there is a sudden and morbid reaction. Vaughan explains the condition far more plausibly as not due to an increased sensitiveness of the tissues, but to the presence of enyzmes of the antibody order induced by the first inoculation. He suggests that this ferment is put forth in sufficient quantities not merely to neutralize the protein that called it forth, but to saturate the blood more or less; so that when the second dose of protein appears, its molecules are immediately broken up in such a way that the poison group is released and enabled to act upon the tissues toxically.

But this suggestion involves an obvious and fundamental difficulty; it assumes that the antibody put forth in response to a foreign protein will become a menace instead of protection—which precisely reverses the prevalent and seemingly correct interpretation of the character of antibodies.

According to the view of the present writers, the *rationale* of anaphylaxis is something quite different from this. In our view, there is no question of "sensitizing" the tissues to a foreign protein; inasmuch as they are inherently sensitive to all proteins, foreign or otherwise, at the proper stage of disintegration. Nor can we conceive that the system has developed the incongruous habit of putting forth, in response to a protein invasion, antibodies that will necessarily menace the system itself in the event that the invasion is repeated. Such a phenomenon would seemingly be an exact contradiction of the established customs of the organism. Yet how are we to explain the anomalous fact that

the organism was seemingly unaffected by the first dose, and yet was severely poisoned by the second one, administered after an interval of several days?

The Proteomorphic theory supplies a clear and definite answer, conditioned on the activities of the white and red blood corpuscles in the regular processes of assimilation, as already outlined. We assume that the white blood corpuscle began the proteolysis of the first dose of foreign protein, and that the red blood corpuscle completed it, quite as before; but that the specific enzymes of the red corpuscle adapted for dealing with that particular protein were present in very limited quantities in the blood, and susceptible of being re-formed but slowly by the corpuscle, precisely because the organism was little subject to that particular invasion. Meantime, however, the more generalized enyzmes of the leucocyte, known to be largely non-specific in action, were able to begin hydrolysis of the second dose of foreign protein when it appeared, reducing it to the polypeptid stage at which the red corpuscle should take it in hand. But these corpuscles, exhausted at the moment of the specific ferment (from dealing with the first dose) are for the time being helpless. They will gradually replace the lost enzymes, of course; but as yet they have not had time to do so, at least in adequate quantity, so the foreign polypeptides pass on to the tissues, and some of them are seized on by the brain cells with disastrous results.

The difficulty arises, it will appear, from the fact that the enzyme of the white corpuscle, which begins hydrolysis, is able to attack a great variety of proteins; whereas the enzymes to complete the hydrolysis of the resulting polypeptides must be made, in the case of any specific protein, in a par-

ticular department of the red corpuscles' laboratory.

To meet this necessity, the red corpuscle has developed a very elaborate type of protein, each molecule of its hemoglobin being composed of several thousand atoms; and under ordinary circumstances it is able to manage all the diverse materials that are turned over to it by the leucocyte.

But the circumstances under which anaphylaxis occurs are not ordinary. It is only a protein of unusual type, or a protein that comes in large quantities repeatedly, that can induce the condition, through disarranging the harmonious working of the proteolytic apparatus; except, indeed, that a single large dose of a foreign protein may, under exceptional conditions, be retained in the system for a considerable period (instead of being excreted rather promptly through the kidneys as is usual), in which case, obviously, there may be opportunity for the white corpuscle to begin proteolysis of larger quantities than the red corpuscles can handle.

In the case of the human subject, as just suggested, anaphylaxis may be due to the faulty digestion of the ordinary food proteids, under conditions that lead to the absorption of an exceptional quantity of unbroken protein. It may also result from the ingestion of an unusual type of protein, notably, of course of a type difficult of digestion. In general, we might expect that anaphylaxis from food proteids would result with a frequency in direct ratio to the rarity with which different proteids are digested. It is confirmatory that anaphylaxis from eating shell-fish, lobster, and various fishes seems to be somewhat more usual than that resulting from the proteins of beef, mutton, or fowl. A severe case of anaphylaxis from eating flesh of the snap-

ping turtle has come within the observation of one of the writers.

It should be observed that there are doubtless idiosyncrasies of individual organisms with regard to parenteral proteolysis, just as there are with regard to digestion; and this accords with the familiar laboratory observation that not all animals of a species suffer to the same extent from anaphylaxis under the same conditions.

As corroborating the view just presented, according to which protein-product intoxication is due to the incapacitating of the red corpuscle; and at the same time in corroboration of the general view that the red corpuscle is the agent called upon to deal with the toxic products of protein generation, we may recall the clinical fact that when a tapeworm dies in the intestinal tract, and decomposes there, the absorption of its toxic products may induce the condition known as *bothriocephalus anemia*, a characteristic symptom of which is the very great and persistent reduction in the numbers of the red blood corpuscles.

The red cells absorb the toxin, and effect its removal through the liver; but, owing to the persistence of the supply, such numbers of the corpuscles are involved that their ranks are presently depleted, the cytogenic apparatus being unable to manufacture them at so abnormal a rate. The general symptoms of pernicious anemia, due to reduction of the oxygen, and food carriers, follow as a matter of course; but all the symptoms clear up rapidly so soon as the dead worm is expelled from the bowel.

#### THE SYNTHESIS OF PROTEIN.

Incidentally, it may be urged that the profound systemic disturbances that accompany a reduction in the number of red blood cor-

puscles in this case would never result were the chief function of these cells merely to carry oxygen, as is commonly conceived. Under ordinary conditions, the systemic cells require but a fraction of the oxygen that the red corpuscles can carry, as proved by the fact that protein metabolism is unchanged when the corpuscles are artificially reduced in number by thirty per cent.

The new physiological studies which suggest that air may be breathed over and over without detriment—that, in short, the "fresh air" fetish is founded on a misconception of the needs of the organism—is of peculiar interest in this connection.

In any event, it would not seem to have been necessary to build a cell of an intricate type of protein merely to carry oxygen. Blood serum with hemoglobin in solution would answer as well, and does, indeed, perform this function to a considerable extent under existing circumstances. Nor is it clear why the substance of the red corpuscle should contain nucleo-protein were it merely an oxygen-carrier.

But there was need of a cell carrying a molecule of intricate structure, in which might be stored the potentialities of an infinite number of atomic re-combinations having their tangible representation in the output of endless series of enzymes calculated to carry the hydrolysis of proteins to its ultimate stages; as also to prove antidotal to an unending series of toxic by-products of protein metabolism in the living or dead tissues of the numberless species of animals and plants and micro-organisms with which the environment teems.

In the evolutionary history of the race, these needs have increased *pari passu* with the increasing activities of the individual organism, and the correspondingly varied character of the environment contact. And

so we find, as we come up the animal scale, that the red blood corpuscles constantly increase in relative number in the blood stream. In fishes the red corpuscles form about twenty per cent. of the total volume of the blood; in frogs about twenty-five per cent.; with mammals it rises to from forty to fifty per cent.; and the proportion of red corpuscles to leucocytes rises in something like the same proportion.

The primitive and generalized leucocyte retains from first to last the same appearance and, as we believe, fulfills the same primitive functions. It is a wandering phagocyte in the vascular system of the sponge; it remains a wandering phagocyte in the vascular system of man.

In the primordial state, the red cell was relatively large and nucleated as it still is in the embryonic state, and in certain reversional diseased conditions.

But in the developed condition the reproduction of the corpuscles devolves upon the mother cells in the red bone marrow so the corpuscle itself needs no nucleus—or perhaps we should rather say that it is all nucleus, since it contains nucleic acids. It is decreased in size, giving it relative increase of surface, that it may more effectively patrol its environment; and it is sent forth from the mother cells in such galaxies that, under normal conditions, there are five million individuals in each cubic millimeter of the blood-plasm.

Millions on millions of the cells are annihilated every hour in the juggernaut of the liver; but the ranks are as perpetually replenished.

To build the new cells required a constant supply of materials capable of being elaborated into an intricate type of protein. To build each molecule of this protoplasm requires some thousands, in the aggregate, of

atoms of carbon and hydrogen and oxygen and the elusive nitrogen; some hundreds of molecules of amino-acids, the materials directly utilized.

The total energy required in the building up of these intricate molecules in the bodies of uncountable myriads of red corpuscles hour after hour and year after year, throughout the life of the individual organisms, is colossal. Each red corpuscle is a proteid body, its substance composed in part of hemoglobin, the formula for which has been computed as  $C_{758} H_{1203} N_{195} O_{218} S_5$ . To suppose that the organism exhausts this material and wastes the energy essential to its compounding merely to produce a transporter of unmodified oxygen, would require a reversal of all our conceptions of economy of management in the cellular body politic. Yet such is the current conception of physiologists in general.

But there has been experimental evidence at hand for many years that, if properly interpreted, would disspell this misconception. As long ago as 1872, Bauer, in Voit's laboratory, studied the results of bloodletting in the dog, and found that when from eighteen to twenty-seven per cent. of the total blood in the dog's body was removed, there was increased proteid metabolism, but no change in the carbon dioxide elimination. Some years later Finkler, in Pflüger's laboratory, withdrew one-third of the total blood from a dog, thereby reducing the rapidity of blood-flow in the femoral artery by one-half, without producing any change in the quantity of oxygen absorbed or of carbon dioxide exhaled. More recently Hawk and Gies have confirmed the early experiments to the extent of showing that there is a higher proteid metabolism after bloodletting.

Such experiments are utterly disconcert-

ing so long as we consider the red blood corpuscle only as a carrier of oxygen. Note the conditions: the blood is reduced in quantity even by a third, the corpuscles being of course reduced proportionately. Yet the absorption of oxygen and the giving out of carbon dioxide are unmodified; and, even more strange to relate—according to accepted physiological teaching—the rate of proteid metabolism is increased.

There is nothing in the least anomalous about these phenomena, however, if interpreted in the light of the Proteomorphic theory. In this view, the mother cells that produce the red corpuscles, together with those that produce the leucocytes, constitute the great protein-synthesizing mechanism of the body. Out of the amino-acids in the blood stream and lymph stream, according to our belief, the mother cells of bone marrow and spleen and lymph nodes build up protein of the specific types characteristic of the particular organism, storing it hour by hour in the bodies of unending series of offspring which we call leucocytes and red blood corpuscles. The protein of their bodies will be ultimately discharged into the blood stream, to make up the proteins (globulin and albumin) of the serum, the great common food supply for all the tissues, and an important source of energy for the bodily activities.

What, then, could be more natural than that when there is such depletion of the ranks of the corpuscles through hemorrhage, the cytogenic mechanism should take on exceptional activity, in the effort to make amends for the loss? But of course the bodies of the corpuscles, being themselves proteins, cannot be built up without requisitioning a supply of protein-building material and giving out a certain amount of left-over material as nitrogenous waste.

Hence the observed increase in the protein metabolism, after severe hemorrhage—which might, in the light of this theory, have been predicted in advance of the experiment. As to the lack of increase in oxygen intake and carbon dioxide outgo, that only furnishes another piece of incidental evidence that no such number of red blood corpuscles is necessary as that normally found in the body merely to carry on the work of oxygen conveying. The necessity for an unfailing oxygen supply is so great, that provision is made for a supply far in excess of the average needs of the organism, as the bloodletting experiments show.

Without minimizing the value of the services of the red blood corpuscles as a carrier of oxygen, then, we may safely assume that its service as a provider of body protein is at least as great. A realizing sense of the significance of this function comes to us when we reflect that the intricate bodies of the red corpuscles are built up in such numbers, that, massed together, they make up a bulk of about four pounds in the body of a man weighing one hundred and sixty pounds.

So this erythrocytic body surpasses in size every other organ in the body with the single exception of its collaborating organ, the liver. The fact that the individual cells of this great organ are scattered should not have blinded physiologists to the necessity for the assumption that so massive a structure must have vastly important functions in addition to the simple task of carrying oxygen. In point of fact, if the analysis just presented be accepted, it is clear that this anomalous viscus is an organ of the assimilative system having a share in protein metabolism subordinate to no other. The function of dealing with bac-

terial poisons may, after all, in the widest view, be considered—even as the function of carrying oxygen must be considered—but an incident in the career of the red blood corpuscle.

Its supreme function is to supply fuel in the form of protein for the bodily activities.

Yet the incidental function of aiding the leucocyte to deal with bacterial toxins cannot be considered an insignificant one, inasmuch as the safety of the organism as a whole may at any time depend upon it. Measured in terms of the health of the human individual, and even in human life, this function of the red corpuscle has paramount importance. It would be rash to assert that its defensive and immunizing functions are less constantly called into action or less important in their results than the allied functions of the leucocyte. Both are essential to the life of the organism.

We have suggested, indeed, that the immunizing functions of the two types of corpuscles must be regarded as complementary, rather than as in any sense competitive. It has been suggested also that, to a certain extent the functions overlap, so that an enzyme secreted by one might facilitate the work of the other. It was tentatively suggested that perhaps opsonin, which so conspicuously aids the leucocyte in its phagocytic functions, may be produced, partly at least, by the red corpuscles in response to bacterial toxins. But in general it is probably the leucocyte, with its less specialized organization, that aids the red corpuscles, rather than the converse.

As a typical instance, we may note that whenever the red corpuscles are decreased in number—say from vigorous blood-letting—the army of leucocytes at once receives notable accessions, being fully replenished within a few hours. A far longer

time will be required to replace the vast coterie of red corpuscles; meanwhile it is the part of wisdom to strengthen the leucocytic outposts. In some cases the numbers of leucocytes may become so great that their bodies must have a really significant share in replenishing the proteins of the blood stream, thus making partial amends in this direction also for the paucity of red corpuscles.

#### THE LEUCOCYTIC BALANCE.

The consideration of such fluctuations in the ranks of the corpuscles naturally raises a question as to how the leucocytic balance is maintained.

We know that under average conditions of normal health the number of leucocytes in the blood stream averages about six thousand to the cubic millimeter, rising to about eight thousand three or four hours after a hearty meal; and that the number of red corpuscles averages about five million to the cubic millimeter and is less subject to wide variations in times of health.

These facts are so familiar that we scarcely think of them as requiring explanation. Yet a moment's consideration makes it clear that the maintenance of the corpuscular balance is a very puzzling phenomenon.

How are the mother cells in the bone marrow and spleen, for example, to know that protein foods have been taken into the stomach, and that therefore an additional supply of leucocytes is needed? How are these mother cells to know that there has been a great destruction of red corpuscles in the liver; or that a wound in some remote part of the body has resulted in a severe hemorrhage? How are they to know that a colony of pneumococci has found lodg-

ment in the lungs, and that fresh bands of phagocytes are required to fight them? How are they even to know that the body is undergoing vigorous muscular exercise; or that a cold bath has been applied to the skin?

These surely are interesting questions. Under all the conditions just noted, the cytogenic cells do, in point of fact, take on exceptional activity, and produce leucocytes in particular in unwonted numbers.

But where is the census-taker of blood corpuscles who has signaled to them that these exceptional recruits are needed?

The more one considers that problem, the more puzzling it seems; particularly in view of the fact that the bone marrow is but doubtfully connected with the nervous mechanism. There are sympathetic nerves in connection with the blood-vessels, to be sure, and these might serve to modify the blood supply; but we can scarcely suppose that this by itself can control the activities of the cytogenic cells, particularly if we recall that the blood-pressure may be increased indefinitely without necessarily causing leucocytosis; whereas, on the other hand, active generation of leucocytes may occur after a hemorrhage that has reduced blood-pressure to the minimum.

It does not necessarily follow from this that the sympathetic nervous system may not have a share in determining the activities of the cytogenic cells. The nervous mechanism may well be supposed to take part in the co-ordinating of the activities of the various mother cells, located in bone marrow and spleen and widely scattered lymph nodes. But there is another and quite different stimulating and co-ordinating mechanism which recent studies have brought into the foreground, namely the

endocrinous system, with its various internal secretions or hormones.

The messengers of this system travel in the blood stream itself, as also doubtless in the lymph stream, and there is a good deal of evidence pointing to these agents as the stimulators and regulators of cytogenic activity.

We have the records of a large number of cases of Diabetes and Graves' disease, in which the therapeutic exhibition of the duodenal hormone, *secretin*, has led to a rapid and extraordinary rise in the blood count, including both leucocytes and erythrocytes. It is interesting to note, as strongly supporting the Proteomorphic theory, that this corporcular increase coincides with very marked amelioration or total disappearance, of the symptoms of protein poisoning that characterize the disease. But at the moment our attention is directed to the probably direct connection between the exhibition of secretin and the increased activities of the cytogenic cells.

It has been clearly demonstrated that secretin, as produced in the duodenum, enters the blood, and being carried to the pancreas, stimulates that organ to the production of its characteristic tryptic enzymes. What more natural than that the same hormone should carry similar messages to the bone marrow to stimulate the production of the leucocytes that are known to secrete an enzyme closely allied to trypsin, and to subserve, within the vascular mechanism, a function of proteid digestion comparable in a small way to that of the pancreas itself?

In the activities of the hormone secretin, then, if our inferences are justified, we find a solution of one aspect of the problem of maintenance of the corporcular balance. This duodenal hormone being avail-

able as a messenger, the fact that the tissues of the bone marrow take on fresh activities in response to the taking of food into the stomach, seems no longer mysterious, or at least no more mysterious than, for example, the increase in the activities of the pancreas brought about through the same agency.

There are other conditions, however, in which there is increase in the blood count, where the agents through which the cytogenic mechanisms are stimulated may not be so readily traced. How, for example, shall we explain the leucocytosis that takes place in the course of violent muscular exercise?

Here the explanation offered must be regarded as altogether theoretical and provisional, although assuredly not lacking in plausibility. The suggestion we would make is that the increase of leucocytes here is due, in part at least, to the increased flow of lymph resulting from muscular contraction. It is known that lymph scarcely flows at all in the lymphatics of the limbs during quiescence, but is stimulated by active or even by passive movement. It is known also that lymph flowing through a lymphatic gland is observed to emerge with an increased increment of leucocytes, and the inference seems unavoidable that the leucocytes in question were developed in the lymph node. It is a fair inference that their rate of development depends on the rate of flow of the lymph which must bring the food albumen to their mother cells, and if this be admitted, the increase in such of the leucocytes as are developed in the lymphatic system as a result of muscular exercise is accounted for.

A word should be said about the precise service which the lymphocytes thus called forth in response to muscular action render

to the muscles that have indirectly engendered them. This lymphocyte is not a phagocyte, but, if our view be correct, its function, like that of all other leucocytes, is to deal with the fully formed protein molecule. The particular proteins with which this cell deals, however, are not foreign ones, but the normal proteins of the blood serum, (globulins and albumins). These are decompounded to make fuel (including a large proportion of glycogen) to supply energy to the body-cells, and notably (1) to the digestive apparatus, or (2) to those most important dispensers of energy, the muscle cells.

We have suggested that the activity of the muscle cell is conditioned on an increase of osmotic pressure due to a decompounding of the protein within the cell. This is necessarily accompanied by loss of energy, expended as mechanical energy and as heat. The physical contents of the cell are for the most part not wasted, but they cannot be re-compounded into proteins except through the agency of energy supplied from without. The molecules of serum protein, suspended in blood stream and tissue fluids, are decompounded to supply this energy. And, according to the present view, the lymphocyte is the agent (or at least one of the agents) supplying the enzymes that inaugurate this process of decompounding.

Hence the urgent necessity for an increased supply of these leucocytes in times when the muscles are called upon to undergo excessive contraction for prolonged periods.

Hence, also, the necessity for an increase of lymphocytes after the ingestion of food, to aid in the decompounding of serum proteins to supply fuel for the activities for the glands of stomach and pancreas and upper intestines. It is to meet this need

that the lymphocytes are observed (as we have seen) to be sent out in greatly increased numbers during digestion. The supply of digestive ferments cannot be made out of nothing. The cells of the digestive apparatus cannot keep up their activities unless they are supplied with energy from without. It is the province of the serum proteins to supply this energy, in part at least, here as in the case of the muscles and other tissues; and the lymphocytes, according to the present view, have a share in bringing about the decompounding of the serum proteins, through which their energy is liberated and made available.

Should the numbers of the lymphocytes seem inadequate for such a task, it may be pointed out that their work is the relatively simple one of tearing to pieces an unstable molecule. Possibly nothing more is required than to seize on a single group containing the protein molecule's three sulphur atoms to send the entire structure, with its thousands of carbon hydrogen, oxygen and nitrogen atoms, tumbling.

Incidentally, we may call attention to the curious interest that attaches to the observation of the cyclic co-ordination of parts evident in the observed fact that the lymphocytes which (in our view) aid indirectly in the production of the digestive ferments, are themselves called into being through a stimulus to their mother cells sent out as a hormone messenger from the digestive apparatus itself.

Similar cycles of co-ordination, however, are not unusual in the organism. Indeed, the case just cited of the lymphocytes developed in the lymph nodes through the action of the muscles, and in turn serving presently to aid the muscles that indirectly engendered them, furnishes us another and no less striking illustration of such an harmonious dual alliance.

#### HORMONES AND THE CORPUSCLE-BALANCE.

We must not claim space in this preliminary announcement to discuss in detail the rationale of operation of the remaining causes that are observed to promote leucocytosis, which include cold baths on one hand and fevers of microbic origin on the other; contenting ourselves with the suggestion that the cold bath stimulates the vasomotor apparatus of the sympathetic system; and that the bacterial toxins, when present in the body fluids, doubtless stimulate the cytogenic apparatus directly, while the bodies of the bacteria serve as a food pabulum for the leucocytes that may lead to the proliferation of the latter through cell division.

The normal leucocytosis of pregnancy may also be dismissed with the remark that it furnishes, in view of the known invasion of the blood by foreign (placental) protein, strong corroborative evidence for one place of the Proteomorphic theory.

It seems desirable, however, to speak a little more in detail (though still very briefly) of the part in maintaining the corpuscular balance, and in determining the activities of the leucocytes, that appears to be played by the endocrinous organs; in particular by the adrenal bodies, the thyroid apparatus, and the glands of the duodenum.

To establish a strong *a priori* probability that some at least of the internal secretions directly stimulate the activities of the corpuscles, it is only necessary to appreciate the fact that the corpuscles themselves must be classed among the important members of the endocrinous system; and to recall that the products of the various ductless glands are observed to interact in mutual stimulation and inhibition of the organs that produce them.

When, therefore, to cite a specific instance, it is observed (as in Cannon's experiments) that a sudden increase in the adrenal secretions, induced by an emotional state of fear or anger, results in an immediate increase of glycogen in the blood, in preparation for active muscular exertion, we may justifiably infer that the increase has been brought about, in part at least, by stimulus to the enzyme forming functions of the lymphocyte, induced by the presence of unusual quantities of adrenalin in the medium in which the lymphocyte is suspended.

That a hormone may thus stimulate the activities of a digestive ferment, and even add to its capacities, is demonstrated by the experiments in which we have shown that the hormone secretin, when added to trypsin and bile salts, enables these agents to carry forward the proteolysis of peptones *in vitro*, as they cannot do unaided.

Again, the observed fact that persons suffering from hypo-thyroidism are unduly susceptible to the attacks of bacterial diseases, finds suggestive explanation in the theory that a normal supply of thyroidin is essential to the normal functioning of the cytogenic apparatus. Moreover there is a certain amount of direct evidence for the claim that the exhibition of thyroid extract promotes cytogenesis; a claim that gains added force in the light of our observations of the power of secretin, another hormone, to increase the blood count, as already recorded in this paper.

An increase of protein metabolism has been observed in cases of exophthalmic goiter; and the experiments of Anderson and Bergman show a similar increase from the giving of large doses of thyroid extract. If the rôle of the corpuscles in proteolysis here presented be accepted as valid, these

observations would form another bit of presumptive evidence linking the thyroid apparatus with the cytogenic mechanism.

And in any event, our extensive clinical observations (including two hundred cases of Diabetes and Graves' disease), in which the exhibition of secretin has invariably been associated with marked increase in the blood count, including both leucocytes and red corpuscles (the count of the latter sometimes rising above seven million to the millimeter), seem to establish beyond cavil the relation between this hormone and the cytogenic mechanism.

#### THERAPEUTIC APPLICATIONS OF THE PROTEOMORPHIC THEORY.

To the clinician it perhaps does not so greatly matter as to what theoretical explanations are given of the relations of hormones or other agent to the stimulation of the cytogenic system. It suffices to know that there are certain available agencies through which the production of corpuscles may be stimulated; and through which, therefore, according to the present theory, the processes of normal protein metabolism and incidentally but most importantly, the immunization of the patient against bacterial diseases, and the cure of these diseases themselves, may be facilitated. What these agencies are, has been suggested in the course of the preceding discussion.

It remains now to make a few practical suggestions as to the utilization of these agencies; and, in general, as to the benefits that may accrue to the patient through recognition, on the part of the physician, of the principle that the blood corpuscles, white and red, are the all important agents in the fight against bacterial diseases.

Let us take as a typical illustration—be-

cause the most common and familiar—the case of a patient suffering from tuberculosis.

The tubercle germ invades practically every human organism. But so well defended is the average system against its attacks, that ninety per cent. of all the individuals of a given generation are able to throw off the invader, and attain full individual immunity to its attacks. Such immunity, conditioned on the hereditary status of the germ-plasm, is passed on to the offspring of the individual.

But ten per cent. of the individuals of each generation are not able thus to ward off the attack; on the contrary they succumb to it, and after all their tissues are devitalized to an extraordinary degree, they ultimately die. Their failure to fight off the germs is, of course, due to an inherent lack in the makeup of their defensive mechanism. The mechanism in their leucocytic and erythrocytic apparatus that should produce anti-ferments against the tubercle germ is either altogether absent, or is devitalized and minimized in efficiency. The result is that their tissues are in a condition comparable to that which the student of anaphylaxis speaks of as "sensitization," and which, we have suggested, should be considered merely as lack of defence. Regardless of the precise terms of the explanation, they are susceptible to the attacks of the germs, and this inherent susceptibility may be passed on to their offspring.

It is of important even if of incidental interest to recall that, according to the recent studies of heredity, this susceptibility acts as a Mendelian recessive.

That is to say, a susceptible person, mated with a normal or resistant person, will have offspring that are normally re-

sistant, but who contain in their germ-plasm, as a recessive trait, the factors of susceptibility or lack of immunity. If such personally resistant but potentially susceptible individuals are mated, one of their offspring in four, on the average, will be susceptible. This is of great importance from the standpoint of the eugenist, but need not be considered further in the present connection.

Suffice it, for the present, that even the susceptible person is susceptible only in a relative sense, and is by no means altogether without a defensive mechanism. His chief danger may lie in the fact that his cells are partially habituated to the presence of this toxin, and therefore will not respond to it actively.

If we inquire what can be done to stimulate the defensive response, we are at once reminded of the methods that lead to an increase of the numbers of the leucocytes in the blood. The ingestion of hearty food, notably protein, leads to such increase. Active exercise leads to such increase. Cold baths stimulate such increase. Nourishing food in the largest quantities that can be assimilated; exercise of a fairly vigorous type, and hydrotherapy would seem to be theoretically indicated. Also fatty foods to conserve the protein, and iron to facilitate production of hemoglobin. No practical physician needs be told that these measures have been shown empirically to be of the greatest value in the treatment of tuberculosis.

Recent experiments have shown that air at very low temperature has a stimulative influence similar to that of the cold bath. This observation seems to explain the familiar clinical fact that tuberculosis may be treated advantageously in very cold climates. The results of sleeping in the open

air in an almost arctic temperature are familiar to clinicians. The cold temperature is probably as directly beneficial as the fresh air itself.

As to exercise, practised before the patient reaches a stage of asthenia that makes it dangerous, the beneficial results are equally little in doubt. Mountain climbing, with attendant fatigue falling just short of extreme exhaustion, is a recognized therapeutic measure of the utmost importance. In all probability, the climbing rather than the mountain air produces the benefit.

Incidentally we may note, in confirmation of the view of erythrocytic activities here presented that the blood is thicker at high altitudes, so that the red corpuscles are relatively more abundant and hence patrol the blood better; but that the total amount of hemoglobin is not correspondingly increased (Viault, Abderhalden).

The value of the cold bath has long been recognized by a few astute clinicians, who have found it difficult to gain headway for their views partly, perhaps, because the *rationale* of the benefits to be expected has hitherto been obscure. The knowledge that the cold bath directly stimulates the production of an additional army of leucocytes; coupled with the belief that the leucocyte is the pre-eminent agent of immunization against the direct invasion of bacilli, furnishes the all-sufficient answer. The cold bath may have other beneficial effects, but this one alone justifies its use in all bacterial diseases in which there is an inherent tendency to defective leucocytosis.

A striking illustration of the value of the cold bath is furnished in the reports of the Munich military hospital, in which records of more than eight thousand cases show that since the cold bath was used habitually in the treatment of typhoid fever, the

mortality of that disease was reduced from forty-two per cent. to three per cent.

As to the matter of a liberal diet, there would be no difference of opinion in the case of the consumptive, but opinions might differ, and undoubtedly would differ, when acute fevers are in question. Indeed, the old familiar rule to "starve a fever" has been an axiom upon which the average physician has acted somewhat persistently. But it has recently been suggested by Coleman that this rule is perhaps as fallacious as the other rule, now fortunately abandoned, that the fever patient should be deprived of water as well as of food. Coleman reports gratifying results in typhoid fever cases in which a liberal diet was provided. "Not only is the course of the disease favorably influenced," he says, "but the condition of the patient is vastly improved."

And these recent observations are, after all, only confirmatory of experiments conducted by Von Hosslein more than thirty years ago, which showed the value of a liberal diet in ordinary fevers.

If we ask why a liberal diet, including proteins, is essential in the treatment of fever, the answer is not far to seek. According to theory, the leucocytes and red corpuscles fight the invading proteins and enzymes by constantly putting out chemical compounds that antagonize them by cleaving their complex molecules on one hand and by combining them into new and harmless associations on the other. But this constructive work on the part of the corpuscle implies the expenditure not merely of energy but of matter. And material for this expenditure must in some way be found to make up for the constant depletion.

The corpuscles can no more be expected to perform their work without being sup-

plied with fuel than can any other machine.

Nor can new corpuscles be developed to fill the constantly decimated ranks without drawing on an unfailing supply of proteins. And unless this material is supplied in the pabulum that comes from the outside world, usually through the medium of the intestinal canal, it must be found elsewhere. And obviously the only other source is the body tissues themselves. So if the defending hosts are not supplied with food pabulum from without, they must draw on the tissues of the body, with a weakening effect. Hence the rapidly emaciating effect of fevers, with attendant weakness; an effect largely avoided through use of a liberal diet.

It will be understood, of course, that the catabolic activities of the leucocyte and red corpuscles, in which complex protein molecules are constantly cleaved to smaller molecules and arranged in new combinations, must be attended by a constant liberation of heat. So the fever itself is in part an evidence of the activities of the corpuscles. And liberal feeding, provided the food is assimilated, may unquestionably tend to enhance the fever.

But the modern clinician does not regard fever as in itself necessarily disadvantageous to the patient. On the contrary, he associates it with the immunizing and curative processes in the body. So he does not regard a rise in temperature as necessarily an evil. He knows that the phagocytic activities of the leucocytes are greatly accelerated when the temperature is high; the leucocytes have been observed at increased temperatures to "dart about like bees around a hive." It may reasonably be inferred that the chemical activities of all the immunizing agents are correspondingly accelerated.

Nevertheless there are dangers in excessive temperature, if for no other reason because tissues that it is essential to conserve are also stimulated thereby to unwonted activity. So it is highly desirable from time to time to accelerate the removal from the body of the excessive heat due to the chemical activities. And of course the best practical means of accomplishing this is the cold bath.

The idea of giving a fever patient liberal potations of water, feeding him freely with nourishing foods, and from time to time plunging him into cold baths or swathing him in cold packs would have come very near to giving an apoplectic shock to the best clinicians of a century ago. But nowadays such procedures have the fullest experimental or clinical warrant, and find explanation in the data of physiological chemistry.

It is probable, however, that comparatively few clinicians among these who use the cold bath habitually in fever cases, and recognize its value in the direct reduction of temperature, take cognizance also of its significance in stimulating the cytogenic organs to the production of new hosts of germ destroyers. Yet it is probable that the latter is by no means the least of the services performed by the cold bath.

It is a little difficult to accustom one's self to the idea that there is no necessary connection between the degree of fever and the virulence of intoxication. But the truth of this proposition is suggested by the familiar observation that infants often show a high temperature when their maladies are comparatively mild. And it receives experimental demonstration through the observations of Vaughan and others to the effect that small doses of a protein poison may cause a rise of temperature in animals

where far larger doses of the same toxin produce no fever, but may even cause a fall in temperature.

Vaughan very justly refers to this as a puzzling and not clearly explicable fact. A conceivable explanation might be that small doses stimulate the defensive leucocytic mechanism, while large doses act with such suddenness and violence as to paralyze them; just as they sometimes seem to be helpless when they have ingested a large number of toxic bacteria. It should be recalled that the introduction of these large doses of foreign proteins directly into the vascular system is a phenomenon that would be of exceeding rare occurrence outside the laboratory. The fang of a serpent is about the only mechanism in the natural world that would be capable of introducing a foreign protein in quantity into the animal system. So the defensive mechanism has not often been called on to reckon with this contingency, and it cannot deal effectively with excessive doses of toxic proteids.

But, however explained, these laboratory experiments are of great value in teaching the clinician that he must not depend too fully on his clinical thermometer as a guide to the virulence of disease.

As to pharmaceutical agents calculated to stimulate the activities of the cytogenic system, our chief resource at the moment is secretin, to which reference has been made. There is a considerable body of evidence however to show that thyroid extract tends to increase the supply of antibodies in the system. Muller, for example, found the injection of thyroid preparations followed by an increase, in from twenty-four to thirty-six hours, of the normal hemolysis in rabbits and other animals. He ascribed this result to the presence of iodine

derivatives, notably of iodipin, which he sometimes substituted for the thyroid preparation.

Whether the observed results be due to action on the liver, as Muller believes, or to influence over the cytogenic system, in accordance with the present view, is perhaps immaterial from the standpoint of the clinician. In any events, the exhibition of small doses of secretin or of thyroid extract, unless for some reason contraindicated, seems desirable as a routine treatment in the combating of bacterial diseases. But Sajous' caution to use only small doses of thyroid should be carefully heeded. Probably not more than one grain three or four times daily should be given in ordinary cases. Very large doses almost certainly stimulate destructive metabolism in the body tissues in general, which would obviously be disadvantageous or even perilous.

It is possible that a drug even more directly beneficial in its effect on the defensive mechanism may be found in extract of spleen. Recent experiments show that the administration of powdered spleen leads to an active increase in the number of leucocytes. This work as yet is only at the experimental stage, but it is obvious that, from the present standpoint, the desirability of making careful tests of spleen extract as a medicinal agent in the combating of infectious diseases is imperative.

If the findings of the experiment are confirmed, the extract of spleen should prove a very valuable addition to the armamentarium of the physicians. No other known medicament, with the possible exception of secretin, seems to give such direct promise of aid to the immunizing mechanism. If spleen extract proves really capable of increasing the army of the leucocytes, it may

be requisitioned in the case of any and every bacterial disease. Its service would thus be far more general than that of any specific serum or vaccine, since each of these is necessarily directed against only a single type of enemy.

It would seem on theoretical grounds that bone marrow should also prove a useful accessory. This substance was formerly held in esteem as a "blood maker" but it has dropped out of common use in recent times. It certainly deserves to be restored, and much may be expected of it, in view of the results of kindred applications of the principles of organotherapy.

#### SERUMS, VACCINES, AND DIRECT CYTO-THERAPY.

With serum and vaccine therapy in general, the present paper has of course only the most incidental concern. There are certain aspects of the subject, however, that may advantageously be given brief consideration, from the standpoint of the Proteomorphic theory.

Consider, for example, the observation of Dr. W. H. Park, to the effect that when a horse having a strongly antitoxic blood is injected intravenously with a definite amount of toxin, very little production of antitoxin takes place, because the toxin is neutralized by the antitoxin in the blood, whereas the same amount injected in scattered spots subcutaneously will produce a large amount of antitoxin. Dr. Park argues, logically enough, that such portions of the subcutaneously injected toxin as come into the blood stream will meet the same fate as that injected intravenously. He concluded, therefore, that some or all of the cells in the area in the subcutaneous tissues that the toxin reaches much take part in producing antitoxin.

This conclusion is obviously in harmony with the Proteomorphic theory, which postulates that body-cells of many types may on occasion respond to the invasion of toxins of the polypeptid order of chemical complexity. It should be recalled, however, that white and red corpuscles are everywhere within reach, in more or less static capillaries and tissue fluids, and that their services may have been available, even though the injection was not made directly into the blood stream.

Again in Sir Almroth Wright's application of vaccine therapy to localized infections already in being, such as boils, and even to general infections, including typhoid fever, the injection is usually subcutaneous or intramuscular, not intravenous, but it is obvious that the leucocytes residing at the moment in the static tissue fluids and lymph spaces are brought directly into contact with the invading bacteria (in this case dead, but laden with their foreign protein). They are seen to accumulate and to attack the dead bacilli actively, and we can hardly doubt that they are directly stimulated to send out antidotes—complement, opsonin, bacteriolysin—that presently percolate into the general blood stream and are carried to the special tissues where the invasion of living germs is taking place.

In this case, the locally injected germs are unquestionably attacked and largely engulfed by the local garrisons of leucocytes, and it is difficult to conceive what other agent can be responsible for the secretion of the antibodies with which the blood presently becomes infused.

Although it seems almost unavoidable to conclude, in such a case as this that the white blood corpuscle is the agent of antibody production, where protein poisons are in question, yet the conclusion, after all,

is inferential only. Some remarkable experiments have recently been made by J. W. Vaughan, however, in which the genesis of specific enzymes in the body of the leucocytes in response to protein poisoning, is demonstrated.

In these experiments, as recorded by Victor C. Vaughan, the inoculation of sheep or rabbits with finely ground cancer tissue led to the rapid increase of large mononuclear leucocytes in the blood, until they reached twenty-five per cent. or more of the entire leucocytic population. The animal is then bled, the blood is laked with acetic acid, and the leucocytes are collected in a centrifuge. They are rubbed with sterile sand in salt solution and passed through a Berkefeld filter.

It is found then that the filtrate contains the specific proteolytic ferment which splits up cancer cells.

"This is shown by incubating it with cancer cells; when the poisonous portion of the protein molecule is freed, as is shown by the fact that when injected in the fresh rabbit it causes sudden death. Incubated with other proteins, the leucocytic extract liberates no poison. This leucocyte extract when injected in certain amount directly into cancer tissue produces anaphylactic shock."

The experiment justifies the elder Vaughan's conclusion that "this work seems to indicate that the specific enzyme for cancer cells is furnished by the large mononuclear leucocyte." It justifies also his conclusion "that in work of this kind lies a promise of at least partially insulating the anaphylactic enzymes and studying their effects."

"Anaphylactic enzymes," it will be understood, is the term used by Vaughan to describe the so-called antibodies put out in response to foreign proteins, about which

we have all along been speaking.

This experiment certainly shows that in some cases the leucocyte may be the agent of origin, or at least of transfer, of the antibodies directed against poisons. It should be added, however, that the elder Vaughan does not ascribe this function exclusively to the leucocytes, for he expressly states in another connection that it is possible that the protective enzymes are formed by different cells according to the "sensitizer" (i. e., the proteid toxin) used—a view obviously in harmony with the proteomimetic theory, though far too general to be cited as specifically supporting the theory.

It should be added that Vaughan is now testing his extract of mononuclear leucocytes in the treatment of cancer. Whatever the immediate results of this particular test, there is every reason to hope that the method inaugurated, in which the leucocytes are directly looked to for the production of immunizing enzymes, will be generalized and given an important place in therapeutic procedure in the near future. It is a short step from the clear conception that the leucocytes are the chief agents in the producing of immunizing ferments to the direct utilization of the leucocytes themselves in therapeutic procedure.

That an antidote thus prepared may have marked advantages over an antitoxic serum, is clearly suggested in the work of Vaughan just referred to. For he found it impossible to use the serum of a "sensitized" animal, because in the first place, repeated injections of the serum caused albuminuria; and in the second place, they "sensitized" to the proteins of the serum. The leucocytic extract also "sensitizes" to the blood serum, until it is passed through a Berkefeld filter, after which it is in-

nocuous. All of which may readily be interpreted in terms of the Proteomorphic theory.

Here, then, is at least a strong suggestion of the possibility of producing antibodies directly from the filtered bodies of the leucocytes, and avoiding the danger of serum disease which is well recognized as attendant on the present method of serum therapy and which sometimes has such alarming results.

#### BY WAY OF SUMMARY.

With the presentation of this rather convincing piece of direct evidence, we will conclude the preliminary survey of the scope and bearing of the Proteomorphic theory of immunization. But doubtless it will subserve the convenience of the reader if we present here, in conclusion, a summary of the principal theses exposites in the preceding pages. They may be epitomised as follows:

1. The chief immunizing mechanism of the body is the cytogenic mechanism, of which the recognized members are the bone marrow, the spleen, and the lymphatic system. The active agents through which the process of immunization is carried out are the leucocytes and red blood corpuscles generated in the various organs of this system.

2. The prime function of the leucocyte, after it becomes a freely moving cell, is to facilitate and complete protein cleavage or digestion, preparing for assimilation (to the limit of its capacity) all foreign proteins that enter the blood stream. In pursuance of this function, it is provided with digestive enzymes, and with a mechanism for the production of special types of proteolytes to cleave an endless variety of protein molecules, and to counteract toxic pro-

teins or enzymes due to bacterial activities.

3. The red blood corpuscle completes the hydrolysis of polypeptid and allied protein products that find their way into the blood stream. It absorbs or counteracts the toxic residual molecules that are not completely hydrolyzed; and it antagonizes the products of bacterial activity, producing antitoxins. When ultimately autolyzed or destroyed, chiefly in the liver, it gives its protein and enzymes to the blood stream, and its waste products are discharged from the body through the bile duct.

4. The chief work of synthesizing protein out of amino-acids in the organism resides with the mother cells of the cytogenic apparatus—notably the bone marrow and the spleen. But the cells of each specialized tissue—muscles, brain, glands—can on occasion synthesize each its own special type of protein, utilizing the amino-acid building materials. Each tissue can also, on occasion, hydrolyze nitrogenous molecules of the polypeptid order, and give out antitoxic ferments in response to specific toxins. But as a rule the tissues are shielded by the red blood corpuscles from the necessity of performing these functions.

5. The vast multitudes of red blood corpuscles, with an aggregate bulk of about four pounds in the ordinary human body, their substance having been synthesized by the mother cells out of amino-acids, constitute the chief source of the specific proteins in the blood stream, which proteins on being decompounded (with the aid of the lymphocytes) are the prominent sources of bodily energy.

6. Every cell that can unite with a foreign proteid product can produce an "antibody" calculated to antagonize that product. The leucocytes and red blood corpuscles are the particular cells that come

most in contact with such foreign bodies, and they are therefore the chief source of specific proteolytes and antibodies directed against the invaders. The presence in the blood stream of these specific proteolytes and antibodies, secreted by the leucocyte and red cells, and to a certain extent by the body-cells (backed up by the presence of an adequate army of leucocytes and red cells themselves, capable of producing more of the antibodies under stimulus of invasion), constitutes the condition of immunity.

7. Immunization to bacterial disease is merely a special case of protein assimilation. It has in the past been as necessary to acquire immunization against the dietetic proteins—egg, beef, mutton, chicken, fish—and against "benign" bacteria as against the most virulent bacteria.

8. So-called harmless or benign bacteria are those that have been long with us, and which, therefore, the leucocytic mechanism has learned adequately to combat and control. Virulent bacteria are the relatively rare ones or those that have visited us infrequently. A relatively benign bacterium may become malignant, however, through changed conditions leading it to ingest unwonted types of protein; or through developing exceptional vigor; or through invading the system in excessive numbers.

9. Protein anaphylaxis of any type (including "serum disease") is merely a special case of protein intoxication, strictly homologous with protein poisoning from the toxins of virulent bacteria. It results when a general proteolytic (leucocytic) enzyme is present in sufficient quantity to hydrolyze the foreign protein partly, while the red-cell mechanism is temporarily exhausted, so that cleavage cannot be completed, and the tissue cells are attacked.

Protein anaphylaxis is strictly homologous with protein immunization. They are different aspects of the same subject corresponding respectively to the "passive phase" and the "active phase" of Wright's "opsonic index."

10. The activities of the cytogenic system, leading to an increase in the number of blood corpuscles and a stimulus to the activities of the individual corpuscles; and through these to completed protein assimilation and immunization, are governed in part by hormonic stimuli; the internal secretions actively engaged including those of the adreno-thyroid system and secretin from the duodenum.

11. The cytogenic system (including the bone marrow, the spleen, and the lymphatic glands) is a highly important member of the endocrinous system; the detached blood corpuscles are to be regarded as still a part of that system; and the study of the system as a whole offers a fruitful field for discovery of new methods in immunization and the treatment of infectious diseases.

12. The general theory of the action of the cytogenic system above outlined finds support in clinical observations of disease and in empirical therapy; and the theory itself gives important clues to the scientific application of old and new therapeutic measures, including an extension of serum-therapy and vaccine-therapy and the development of a new cytotherapy.

Such, then, are some of the salient aspects of the Proteomorphic theory of immunization; a theory which postulates the cytogenic system as the chief immunizing mechanism, and its daughter cells, the leucocytes and red corpuscles, as the active direct

agents in carrying out the beneficent functions of that mechanism.

It is not claimed that a complete demonstration of the truth of this theory in all its aspects has been presented, nor that such demonstration is possible with data at present available. Nor can it be supposed that all parts of so novel a theory have been correctly conceived. Yet, even as presented, it would appear that the theory throws light into a good many dark places of the realms of physiology and pathology.

In any event, we feel that the fundamental concept of the theory has been made sufficiently plausible to justify, and indeed to demand, a far larger share of attention for the leucocyte and the red corpuscle on the part of bacteriologist, pathologist, and practicing physician than has hitherto been accorded these small but highly important bodies.

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## SOME OF THE NEWER INTRAVESICAL METHODS OF DIAGNOSIS AND THERAPY.<sup>1</sup>

BY

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When your chairman honored me with an invitation to present before your body an exposition of some of the recent advances in diagnosis and treatment of diseases of the urinary tract, so comprehensive an array of facts loomed up before me that I was at loss to decide what particular portion of the subject would interest you most. To touch upon all the various methods that

have found favor of recent years would not only take up too much of your time, but would scarcely leave impressed upon you any lasting or useful facts. I have, therefore, decided this evening to bring to your notice only the gist of those facts which may be of use to you in your own practice including in my remarks, some of the work which I have been particularly interested in and those subjects to which I have contributed my personal endeavors. The subject matter as it will be presented to you will include first, a consideration of those instruments and devices which I have perfected of late years and which have proven useful in intravesical diagnosis and therapy; second, the discussion of the utilization of those instruments, not only in clearing up the diagnosis of vesical lesions, but also of lesions higher up in the ureter and the kidneys; and third, a consideration of some of the important data that have been acquired in diagnosis of urinary conditions by the application of that exceedingly important diagnostic method, so called pyelography or pyeloradiography.

Some four years ago, after some considerable experimentation my efforts to construct a cystoscopic instrument by means of which operative and diagnostic work could be easily carried out, bore fruit in the production of the instrument depicted in Figures 1, 2 and 3. It was found possible without increasing appreciably the size of the catheterizing cystoscope, to construct an instrument which would carry devices of adequate size, so that the execution of operative manoeuvres in the interior of the bladder would be as precise and effectual as the manipulations that can be carried out by the surgeon under the direct guidance of the eye.

The most useful of the devices that can be introduced through the operating cysto-

<sup>1</sup> Read at a meeting of the Eastern Medical Society.

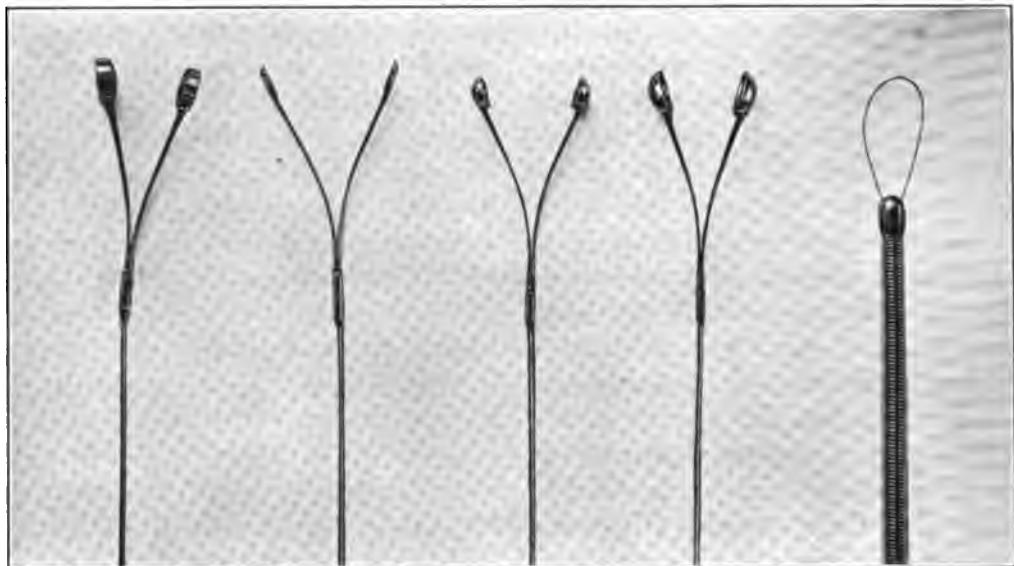


FIG. 1. Grasping forceps, punch forceps and snare for author's operating cystoscope.

scope can be seen in Fig. 1 and 2, where the forceps for the purpose of grasping bodies, punch forceps for the removal of pieces of tissue, and cutting forceps are depicted. Some of these (Fig. 1) are made to pass through a flexible wire canula that can be directed against any part of the bladder interior, others (Fig. 2) close by a scissor like motion and are practically part of the canula itself. In addition to these most generally useful instruments there is the snare (Fig. 1), particularly to be recommended for the removal of papillomata.

Fig. 3 shows the operating cystoscope with one of the operating forceps in place, the handle for the purpose of closing the jaws being also illustrated. The utility of these various instruments will become clear to you as I present illustrative cases in which they have been of value, not only for the purposes of diagnosis, but also in therapy.

Perhaps one of the most important fields



FIG. 2. Scissor type of cutting and punch forceps.

of application for the so-called punch forceps by means of which not only perfected lesions of mucous membrane of the blad-

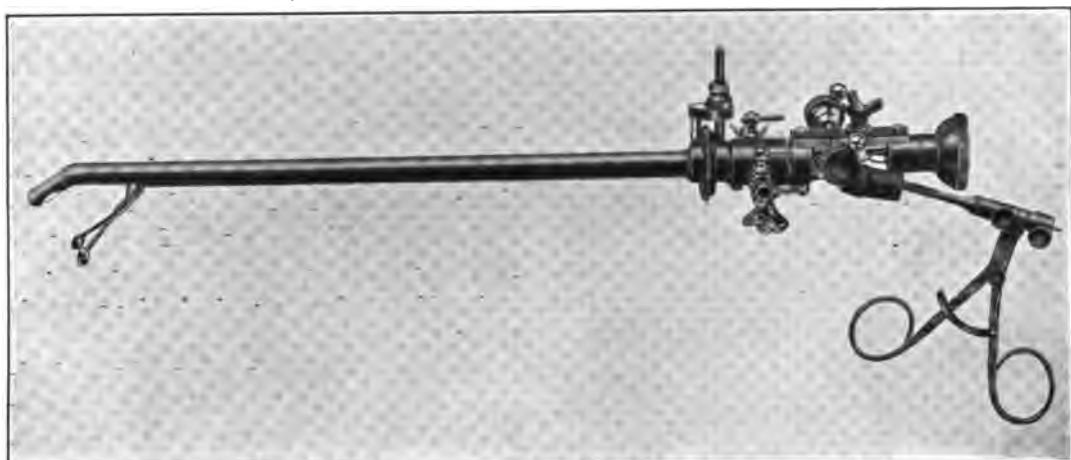


FIG. 3. Operating cystoscope assembly with punch forceps in place.



FIG. 4. Photomicrographs of tissue removed with operating cystoscope showing carcinoma.



FIG. 5. Edematous villus with carcinoma infiltration.

der, but also portions of a tumor may be removed for histological examination, is in the diagnosis of carcinoma. In Fig 4<sup>1</sup> you see represented one of the many dozens of specimens which I have removed in this way and which have been of inestimable value in determining the diagnosis of cancer of the bladder. Strange as it may seem to the uninitiated that the expert cystoscopist should be unable without excision to recognize the difference between a benign and malignant growth, it is nevertheless true that the differential diagnosis can frequently not be made without the aid of a pathological examination. And, so, in applying this method of removal of pieces of mucous membrane or tumor for an exact histological investigation, we have added materially to our knowledge of the interpretation of the cystoscopic pictures. Not uninteresting was the observation that so-called edema bullosum or bullous edema of the mucous membrane in the neighborhood of new growths was usually an indication of malignancy. In many cases where such edematous areas were submitted to the pathologist or where suspicious finger-like excrescences were removed (Fig. 5) we learned that the edematous mucous membrane harbored numerous carcinoma cells. We have learned, therefore, when we are dealing with a necrotic tumor which the pathologist may find difficult to diagnosticate even if adequate pieces are removed to submit for examination portions of the edematous areas which will rarely fail to reveal the presence of carcinoma cells when we are dealing with a malignant epithelial growth.

In the diagnosis of prostatic hypertrophy, we not infrequently are aided in making a

decision as to the presence of carcinoma or adenoma. Very interesting was our experience in a case in which we were dealing with a rather hard and enlarged prostatic gland associated with a small intravesical growth in the region of the trigone. To determine whether the intravesical growth was an intrusion of the prostatic neoplasm or whether it was an independent growth, pieces were removed for microscopic examination. These revealed practically normal mucous membrane (Fig. 6) and under this, carcinoma, undoubtedly prostatic in origin.

Not less valuable is the method of biopsy, so strongly advocated by me during the last few years, in a precise recognition of the nature of small lesions. A most illuminating example of this was afforded by a case in which we were dealing with a primary carcinoma of the prostate attended with a small ulcer, no larger than 4 mm. in diameter, just to the right of the right ureteral orifice. When the ulcer-bearing area was removed with the punch forceps and examined under the microscope, it was found to represent the metastatic carcinoma, as illustrated in Fig. 7.

In your daily practice you will not infrequently encounter cases of painless hematuria of weeks, months or even years duration, perhaps unattended with any other vesical or general symptoms, cases that certainly require investigation with the cystoscope. In many of these patients, one or more growths of the papilloma variety can be discovered. It is of no little worth to the patient to have an early diagnosis in this condition, for it is a well-known circumstance that many papillomata become cancerous. In Fig. 8 there is illustrated a small papillomatous growth in a diverticulum, a rather unusual condition, but suggestive of the ease in which such a growth may

<sup>1</sup> The photomicrographs were kindly prepared for me by Dr. F. S. Mandlebaum, Pathologist, Mt. Sinai Hospital.



FIG. 6. Surface mucous membrane intact; carcinoma arising from prostate on the depth.

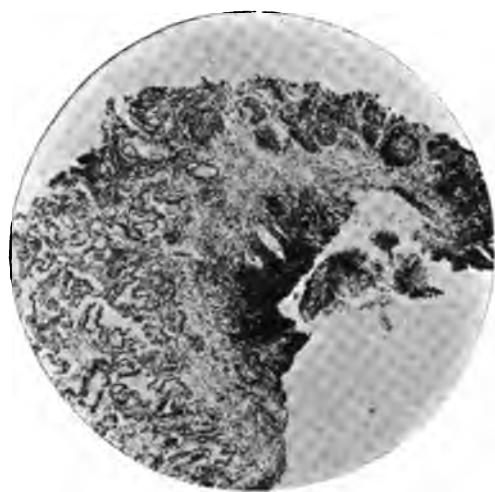


FIG. 7. Metastatic carcinoma ulcer; carcinoma on the left, intact mucous membrane on the right.

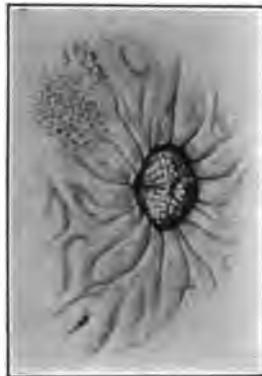


FIG. 8. Papilloma and diverticulum.



FIG. 9. Bladder in region of base of a papilloma, after one application of the snare.

be overlooked. Although the high frequency method of sparking and cauterizing the growth has been most useful in destroying them, we have found it much easier in the majority of instances to rapidly remove the greater part or whole of the tumor at one sitting by means of the snare represented in Fig 1. Not only do we thus obtain material for pathological examination, but we shorten the duration of treatment to a minimum. Fig. 9 shows distinctly how little is left of the growth after one application of the snare. Here you will see the base of the papillomaca growth removed by means of the punch forceps after the application of the cold wire loop. Except for one small verrucous excrescence, no vestige of the papilloma can be seen. Here again the value of the use of the operating cystoscope is demonstrated both in the removal of the growth as well as in establishing a diagnosis of its character and of the nature of its base.

Of the many conditions, the pathology of which has been accurately established since the adoption of the method, permit me to call your attention to that most distressing ailment, *callous ulcer* of the bladder. It is an affection which may remain unrecognized for years, but which you must suspect in those cases of intractable cystitis occurring particularly in young women, where tuberculosis of the kidney or bladder can be excluded. Two such cases have come under my observation, and in both a most remarkable and rapid cure was effected by the removal of the ulcer bearing area with the operating cystoscope.

Fig 10a represents in the region of one of the ureters a fungoid mass composed of lime salt capping a callous ulcer of the bladder. It was found in a young woman who for months had been suffering from dysuria,

frequent micturition, voiding every ten or fifteen minutes during the day and every half hour during the night. Her urine was purulent, bloody, and her condition was pitiful. After cystoscopy, catheterization of the ureters and the exclusion of tuberculosis as the cause of her symptoms, it was decided to remove the fungiform mass as well as the ulcer underneath by means of the punch forceps. A week after this little operation, the symptoms had almost completely disappeared and in two weeks she reported herself perfectly well.

In another similar case (Fig. 10b), a like result was obtained. Histological examination revealed an extremely dense layer of tissue under the superficial, inflammatory and necrotic zone, demonstrating that callous ulcer of the bladder may exist.

Another interesting lesion which is frequently overlooked is solitary superficial ulcer of the bladder. Upon close investigation of some of the cases that come to you suffering with terminal hematuria, there will be found a small superficial ulcer somewhere in the posterior wall or roof of the bladder. Such an ulcer is seen in Fig. 11, where a deposit of fibrino-purulent exudates partly shrouds the ulcer. Such superficial ulcers do not require the radical treatment of excision except in rare instances. Some of them respond to mercury injections, others to the high frequency treatment.

The thoroughness with which certain rare cases can be investigated by the appliances that can be introduced through the operating cystoscope, is well emphasized by the following very interesting example of ureterocele. In a man who had been complaining of indefinite lumbar and sciatic pain, a large pyriform mass was found occupying the region of the left ureter, a

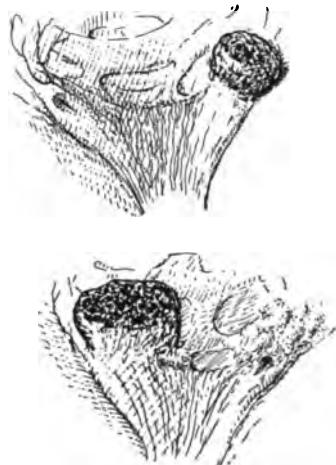


FIG. 10. (Lower) Callous ulcer in case 1.  
(Upper) Callous ulcer in case 2.



FIG. 11. Superficial ulcer near vertex of the bladder; also follicular cystitis.



FIG. 12. Ureterocele; pyriform mass at site of left ureter.



FIG. 13. Pyelogram showing hydronephrotic kidney in case presenting above ureterocele.

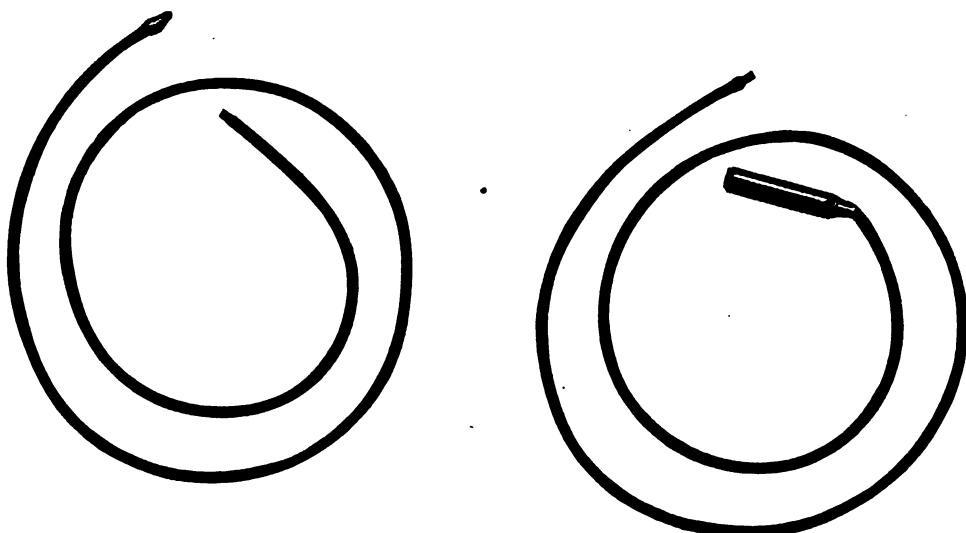


FIG. 14. Dilating olives and bougies for application of current.

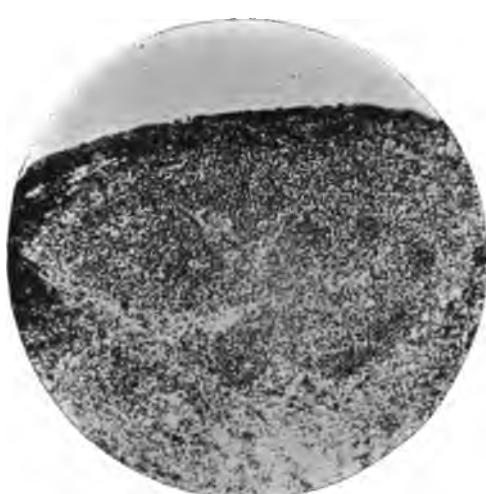


FIG. 15. Lesion in follicular cystitis; formation of lymphoid or adenoid tissue.

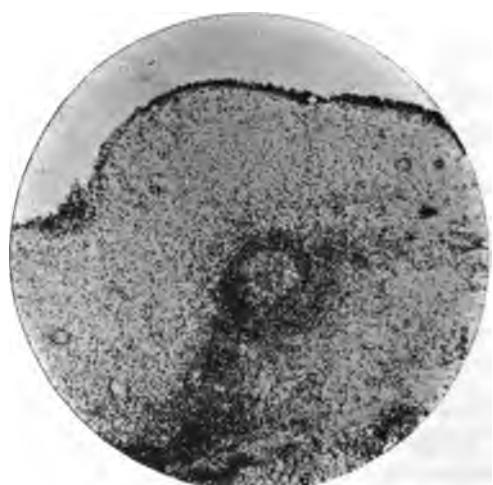


FIG. 16. Edematous lesion with miliary tubercle from lip of ureteral orifice in case of renal tuberculosis.

slight indication of the opening of the ureter being present near the summit of the mass (Fig. 12). We were evidently dealing here with a case of dilatation of the lower end of the ureter, closure of its orifice with the formation of a cyst-like tumor. Heretofore in such cases (except in an instance reported by Kelly of Baltimore) the bladder has been opened suprapubically for the removal of the cyst. In our case, however, it was an easy matter, by means of a cystoscopic knife to thoroughly incise the mass, drain its contents, and, then, with the punch forceps, thoroughly remove the greater part of its wall. This procedure produced collapse of the cyst, and permitted the introduction of catheters for investigation of the condition of the corresponding kidney. When argyrol was then injected, an enormous dilatation of the pelvis of the kidney was demonstrated (Fig. 13).

Amongst the many procedures in which the operating cystoscope is applicable, the method of investigating the patency of the ureter, and, if necessary, producing dilatation thereof, is often of great value. It is well-known that through the ordinary cystoscope, but very small catheters or bougies can be passed. Through the operating instrument, however, we have been utilizing olivary metal tips which can be attached to a long bougie both for the purpose of dilating a strictured ureter as well as for facilitating the passage of descending ureteral calculi. In Fig. 14, this simple armamentarium is illustrated. A number 9 Fr. silk ureteral catheter serves as a bougie and contains an insulated wire cable. One end carries a telescopic coupling for contact with the high frequency machine, the other or distal end is supplied with a tip for attaching the dilating metal olive.

These olives vary in size from 6 to 16 Fr., the smallest resembling in shape the tip of an ear syringe, the larger being flattened so as to permit of exit through the fenestra of a cystoscope.

Using the D'Arsonval current, with one indifferent pole over the symphysis pubis, or abdomen, the other pole attached to the bougie, and employing a current of from 300 to 400 M. A., a very distinct influence seems to be exerted upon the mucous membrane of the ureter in facilitating the passage of the graduated olives through a stricture.

It is surprising with what rapidity dilatation of the ureteral ostium in the bladder can be brought about, and how quickly obstructions situated higher in the ureter will give way under this treatment. In cases of ureteral stone recently impacted, this method of dilatation seems of great value in expediting the downward passage of the calculus.

There are small miliary nodules in the bladder whose general appearance is often suggestive of miliary tubercles, but whose true nature must remain in doubt unless cystoscopic biopsies are performed. In a study of a large number of these lesions, it was found possible to recognize a glandular form of cystitis, a follicular form and true tuberculosis. In Fig. 15 you see well illustrated what we regard as follicular cystitis in which the lymphoid elements have become hypertrophied with a tendency to the formation of adenoid tissue, without, however, there being anywhere the evidence of a true tubercular process. I need hardly impress upon you the importance of making a differential diagnosis between such a benign pathological process and a tuberculous involvement of the bladder, which, as you know, regularly means that one or the other kidney is diseased.

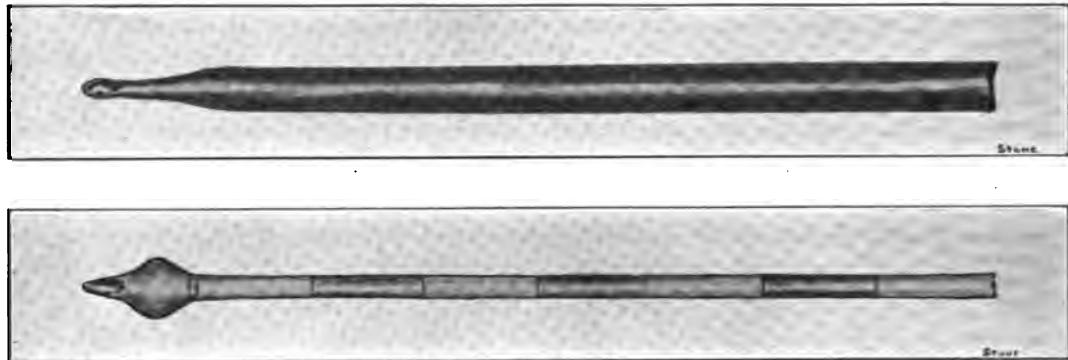


FIG. 17. (Lower) Special bulbous occlusive catheter.  
(Upper) Special conical occlusive catheter.

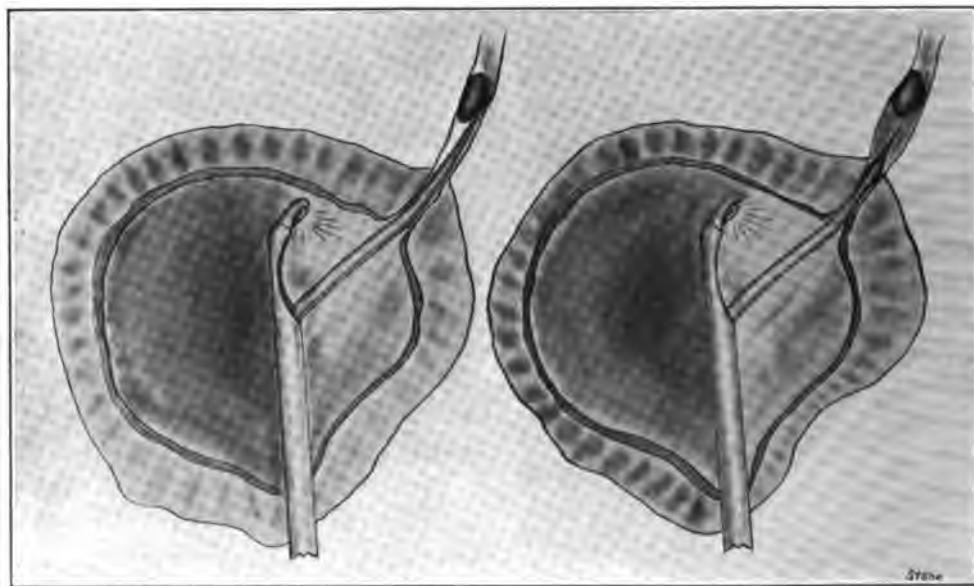


FIG. 18. (Left) First method of demonstrating strictures low down in ureter.  
(Right) Second method of demonstrating strictures low down in ureter.

There is perhaps no disease of the urinary tract in which the importance of the application of the cystoscope and the importance of an early diagnosis is greater than in renal tuberculosis. And, in this disease the symptoms may for weeks, months or even years be so misleading that we not infrequently see these patients treated for cystitis or gonorrhreal urethritis, the true nature of their malady remaining unrecognized. In every case of urinary frequency, particularly in young people, where a definite cause cannot be ascertained we must suspect the possibility of renal tuberculosis. It was most gratifying in the course of our work to have learned that the operating cystoscope can be of considerable value in establishing an early diagnosis. Often it is impossible to demonstrate the presence of tubercle bacilli, or, it may require the use of tuberculin, the inoculation of guinea pigs and a lapse of many weeks before a definite conclusion can be reached. In many of these cases, however, rather early in the disease the experienced cystoscopist will be able to detect the presence of edematous lesions around the orifice of the ureter corresponding to the diseased kidney. Such edematous areas have been recognized for many years; however, it was not until recently that their true pathology was demonstrated. It occurred to me that perhaps the removal of such suspected areas by means of the punch forceps and the examination of the tissue under the microscope would reveal the presence of miliary tubercles. In fact, this was done and you see demonstrated in Fig. 16 that such edematous mucous membrane *does* contain typical tuberculous tissue. We have applied this method now in some 16 cases and have not failed in a single instance to make a definite diagnosis within forty-eight hours by means of the microscope.

It would be hardly possible for me tonight to discuss at length that most valuable procedure in renal diagnosis, the so-called method of pyelography or pyeloradiography. I will confine myself therefore, to a demonstration of the normal renal pelvis when injected with argyrol or collargol, the dilated or pathological renal pelvis, the strictured ureter, the kinked ureter, and to a description of a method which I have been employing of late for the demonstration of obstructions low down in the ureter either produced by calculi or inflammatory processes.

Some three years ago, I discarded the ordinary style of olivary or whistle-tip catheter, and had two types constructed by Eynard. One was provided with a terminal orifice only, the catheter being either 7 or 8 Fr. in size, or larger, and tapering at the point (Fig. 17a). The other type of catheter also had a single terminal hole, but was provided with a bulbous enlargement (Fig. 17), for the purpose of occluding the ureteral orifice. In most instances the former type of catheter will suffice for our purposes. It is employed in argyrol or collargol X-ray, also for the purpose of injecting oil or glycerin beyond a calculus in the ureter.

When we are dealing with stenosis, obstruction, or a calculus very near the ureteral orifice, our technic in pyelography is as follows: The catheter is either pushed up until the tip engages between the calculus and the ureteral wall, where it is jammed tight against the obstruction (Fig. 18a), or a large catheter is selected, of sufficient size to completely fill the ureteral meatus, and is introduced only far enough to prevent reflux of the argyrol solution (Fig. 18b). In both methods, if the catheter is properly introduced, and is large enough to fill the ureteral meatus, regurgitation of



FIG. 19. Argyrol X-Ray demonstrating obstruction produced by a ureteral calculus.

the solution is prevented, as can be easily determined by watching the orifice while injection is being done.

When obturation of the ureteral channel is complete, the argyrol or collargol will be prevented from passing up beyond the obstruction, and the ureter distal to the obstacle will become distended, giving a fusiform shadow (Fig. 19) in the radiogram. In case the obstruction is complete (in the centripetal sense), the injected fluid will first distend the ureter, and, as it finds its way upward beyond the obstacle, the topography of the upper part of the ureter will be revealed.

A recent case in which we were dealing with a stone 4 cm. from the ureteral orifice, and in which it was impossible to pass even a No. 4 Fr. catheter beyond the calculus, afforded a very good example of the value of this technic in demonstrating the extent of the obstructing influence of the stone. Here the second method was employed. The conical catheter was passed almost up to the obstruction, the ureteral orifice being completely blocked so that reflux could not take place. The X-ray photograph (Fig. 19) demonstrated that ballooning of the ureter distal to the calculus took place, and that the argyrol had penetrated upward into the dilated ureter. From the consideration of this particular radiogram the following conclusions could be drawn: First, the shadow truly represented a stone, second, the obturating effect of the stone was considerable in the centripetal sense, sufficient to afford marked hindrance to the injection of fluid in the direction toward the kidney, third, the obstruction (centripetal) was not complete, and, fourth, dilatation of the ureter above the stone had already taken place (obturation in the centripetal sense).

From the standpoint of therapy, too, this method is of value, for the descent of calculi in the lowermost part of the ureter is certainly facilitated by its use. This can be easily demonstrated by taking series of X-rays on days immediately following the argyrol or collargol injection.

## SOME GERIATRIC APHORISMS.

BY

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Some are aged before they are old, some are old but are not aged. Geriatrics deals with the senile state, not with the years of life.

In maturity nature cures, in senility nature kills. Aid nature in maturity, prevent death in senility.

**Anatomical.** (1) The hardness of the xiphoid cartilage is an index of the degree of aging. If resiliant in advanced life the anatomical changes are slight; this includes the arterial changes. Early hardening indicates early senile changes.

(2) Voluntary muscles that have been actively employed undergo atrophy; if they have not been actively employed they undergo fatty degeneration. The former are thin, firm and have clearly defined borders; the latter are soft, flabby with indefinite borders.

(3) The senile stoop, due to anatomical changes, comes on slowly and late; the senile slouch, due to psychic causes, comes on early and rapidly.

(4) Wrinkles if due to age are fine, if due to habit, (worry, mental concentration, etc.) disease or drugs (antiobesity treatment in earlier life) they are coarse. The former appear late; the latter may begin in early life.

(5) The arcus senilis is not a sign of aging as it may be found in youth.

(6) Senile alopecia begins at the temples and on top. Disease alopecia is scattered.

(7) The old man's rheumatism is an arteriosclerosis, not an arthritis.

(8) The thin man's paunch is an enteroptosis in the hypogastric region; the fat man's paunch is fat and gastrophtosis in the mesogastric region.

**Physiological.** (1) Snoring in sleep is of no consequence; groaning indicates cerebral hyperemia or other pathological condition. Talking in sleep, if unusual, is generally a muttering delirium.

(2) Mouth temperature is always one or two degrees lower than rectal temperature and it may vary two degrees at different times of the day in health and more in disease.

(3) Owing to wasted muscles and rigid chest walls even a weak heart may give a strong impulse.

(4) Respiration is increased and heart action slowed the relation being 1 to  $3\frac{1}{2}$  or less.

(5) Diminished gastric acidity and lessened irritability cause the aged to prefer acid and sharp foods and reject alkaline and insipid foods.

(6) Slowed and weakened peristalsis may cause stasis with a daily stool.

(7) Big eaters age early. There is too much waste to be disposed of by the intestines and intestinal decomposition and autointoxication occur.

(8) The old man falls asleep at the sermon through excessive attention which brings on brain fag, not through inattention.

(9) The recollection of early events comes unbidden; the newer events cannot be recalled by any effort of the will.

(10) Mental decay is more pronounced in the manual laborer; physical decay is more pronounced in the mental laborer.

**Pathological.** (1) Organs and tissues undergoing senile degeneration cannot accommodate themselves to the altered functions of allied organs and tissues that are diseased.

(2) Stimulation of a degenerating organ or tissue hastens the degeneration.

(3) Uniform increase of connective tissue between the apices of the pyramids of the kidneys is physiological; unequal increase is pathological.

(4) The senile spleen is usually so small that its increase in the various diseases associated with splenic enlargement, cannot be determined.

(5) If there is retinal arteriosclerosis, there is a general diffused arteriosclerosis.

(6) A primary aortic insufficiency is produced by dilation of the ascending aorta.

(7) In acute gastritis with active fermentation the gases produced press upward upon the diaphragm causing palpitation and gastric asthma. It is the height of folly to attempt to repress the belching up of the gas.

(8) In every case of malignancy in warts, nevi and other dermal affections there is a history of irritation, generally an attempt at removal.

(9) Atheroma is a fatty degeneration, arteriosclerosis a fibrous or calcareous degeneration of the arterial walls. The former produces a softening of the vessel and hardening occurs only after fibrosis or calcification has set in.

(10) Many senile degenerations resemble pathological conditions of maturity but do not give the same symptoms.

**Clinical.** (1) Chills are rare and serious, chilliness is frequent and of no consequence.

A disease beginning with a chill is always grave.

(2) A high temperature is always grave; a sudden drop usually precedes death.

(3) Typical temperature curves such as are found in typhoid fever, and malaria, are rare in the aged.

(4) Pain is frequently absent in ordinarily painful diseases, such as peritonitis, appendicitis, gastritis, cholecystitis, pleurisy and pneumonia. (The aged often deny pain to avoid examination).

(5) A pain for which no cause can be found and which shifts its site from day to day indicates malingering with mental impairment.

(6) The pulse at the two wrists may differ in force and hardness and beats may be lost in transmission.

(7) Neither pulse, pain nor temperature is a reliable guide in determining the diagnosis in the aged.

(8) The normal high point of systolic pressure can be estimated by adding the age to 100 mm. A sudden and material drop indicates decompensation or collapse.

(9) Vomiting unless deliberately induced is rare and occurs only in serious diseases.

(10) Perspiration unless deliberately produced or occurring in very hot temperature, is rare and indicates a grave, debilitating disease.

**Diagnostic.** (1) Albuminuria without casts indicates contracted kidney; with casts, nephritis. The former is physiological and requires no treatment; the latter is pathological and should be treated.

(2) Continued bacterial ammoniacal urine without pain, fever or dysuria indicates retention of decomposing urine in the vesical folds and pouches.

(3) The dysuria of calculus is worse toward evening after the patient has been

standing much; of prostatic disease it is worse during the night or in the early morning.

(4) Indicanuria is always present in the aged.

(5) Lienteric diarrhea indicates excessive food; mucous diarrhea, improper food.

(6) Infectious diseases except such as develop in localized lesions as erysipelas, are rare and serious and do not run a typical course.

(7) A recurrence of early tuberculosis is mild; a primary tubercular infection in old age is fatal.

(8) Aged exposed to diphtheria infection may show slight local symptoms including the presence of the bacillus without constitutional symptoms. Antitoxin is useless in these cases.

(9) Headache and vertigo, intermittent and not affected by position, reading, light or sound are due to cerebral arteriosclerosis.

(10) In determining the diagnosis in senile cases, every symptom must be traced to its source and its relation to the suspected disease must be ascertained before we can say that it is a symptom of that disease as accidental and incidental complications occur frequently.

**Therapeutics.** (1) Rule.—Increase dose of stimulants and decrease dose of sedatives.

(2) Never give drugs in anticipation. Wait till the indication for the use of the drug is clear, and stop its use when the desired effect is produced.

(3) When K. I. has ceased to lower the blood pressure in arteriosclerosis its further administration is harmful.

(4) Belladonna prevents the griping of aloin by counteracting the peristaltic stimulation of the latter. Much smaller doses of aloin can be given if the belladonna is omitted.

(5) Secondary effects of drugs may act more powerfully upon the senile organism than the primary or desired effect.

(6) Morphia is a powerful respiratory depressant in the aged. If given per os atropia should be given a few minutes before; if given hypodermically they should be given together.

(7) No cardiac stimulants while compensation is complete.

(8) Drugs containing tannin are absorbed slowly or not at all.

(9) Mineral oil in large doses does more harm than good. It coats the intestinal walls interfering with the secretion of the already diminished intestinal juices.

(10) Drugs act differently upon senile degenerating tissue than they do upon the normal tissues in maturity. They should be given singly if possible, and the action of each determined in each individual case.

**Hygienic.** (1) When the teeth fall out it is a signal for the discontinuance of food that must be masticated. This applies especially to meat.

(2) The "little and often" rule for feeding is wrong. Five hour intervals and sufficient at each meal should be the rule.

(3) If the aged person is drowsy after the meal he should lie down; not sleep sitting.

(4) Soft stools are more important than daily stools.

(5) Keep dishes of water on hot air radiators and stoves in winter. The excessively dry atmosphere of houses so heated increases the dryness of the throat and bronchial tubes causing further atrophy of the mucous glands.

(6) The mind occupied with some task does not dwell upon self and death.

(7) Flattery is a more powerful mental stimulus than drugs.

(8) The aged are very susceptible to unconscious mimicry. The companion of a patient with a tremor or hemiplegia will develop a like tremor or gait synchronous in time and extent of motion.

(9) The aged do not smell their own bromidrosis.

(10) Dry warm air in hypertrophic bronchitis (the old man's winter cough.) Moist warm air in atrophic (senile) bronchitis.

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## SLEEPING SICKNESS (TRYPANOSOMIASIS).

BY

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The disease known as sleeping sickness was probably introduced in Uganda, in Africa, when Emin Pasha's Soudanese and their wives and followers, numbering some 10,000 were brought into and settled in Busoga. These natives were brought from the edge of the Congo territory lying to the west, and therefore from a country in which sleeping sickness has been endemic for an unknown time. It seems, then, quite probable that some of these natives, brought in with the remains of Emin Pasha's expedition, may have brought the disease into Busoga, and that from this focus it slowly spread to the neighboring population.

Sleeping sickness is a curious disease, and is essentially a disturbance of the functions of the brain. A slow chronic inflammatory process takes place in the brain substance, which after a time gives rise to the peculiar symptoms of the disease. But for a long time, sometimes years, the preliminary symptoms of sleeping sickness may be of so

slight a character that no one suspects there is anything wrong.

The sleeping sickness patient may go about doing his ordinary work for years without his friends noticing there is anything the matter. But gradually a slight change in his demeanor becomes evident; he is less inclined to exert himself; lies

If you ask him to hold out his hands, you find that they are weak and tremulous. When asked to walk, his gait is faltering. When he answers a question, his voice is weak, indistinct and monotonous.

The symptoms gradually become worse and after several months, the patient is unable to walk, unable to speak, and unable



FIG. 1. Sick negroes in a detention camp—not one will escape death. The man in the rear is a guard to keep them from escaping.



FIG. 2. Doctors risking their lives in the swamp, collecting tsetse flies alive with nets.

about more during the day, and at last his intimates see that he has the first symptoms of this absolutely fatal malady.

The face is sad, heavy, dull-eyed and apathetic. The sufferer is, however, well nourished, and this is the rule if patients are well nursed and fed. If you examine a patient's pulse, you find it rapid and feeble.

to feed himself. He is then, of course, altogether confined to his bed, lying in an absolutely lethargic condition all day long. It is in this stage that the sick are often neglected by their friends; they remain unfed, and become greatly emaciated.

What is it that causes this peculiar disease and gives rise to these various symp-

toms? If the blood from a case of sleeping sickness is examined under a high-power microscope, an actively motile parasite may be seen, which is known by the name of trypanosome. These blood parasites belong to the lowest group in the animal kingdom, the protozoa. The trypanosome consists of a single cell, and in its best known form is a sinuous, worm-like creature, provided with a macronucleus and a micronucleus, a long terminal flagellum, and a narrow fin-like membrane, continuous with

osome is found all over the world, and when I was in Uganda, the blood of the ordinary, common, wild, field rat was often found to contain myriads of these creatures.

This trypanosome does not appear to do any great harm, or to have any effect on the health of the rats. The next important trypanosome was found also in India, in the blood of horses suffering from surra. This disease, surra, is closely related to the tsetse-fly disease of South Africa, or, as it is called by the natives, nagana.



FIG. 3. A Uganda chief and some of his men—the chief is seen standing in front of the boat and is a type of these people. Like the others he is over six feet in height.

the flagellum and running the whole length of the body.

When alive it is extremely rapid in its motions, constantly dashing about, and lashing the red blood corpuscles into motion with its flagellum. It swims equally well with either extremity in front.

Among the first to draw attention to these blood parasites was the late Surgeon-Major Timothy Lewis, who in 1888, discovered trypanosomes in the blood of rats in India; to these he afterwards gave the name of *trypanosoma Lewisi*. This rat trypan-

The trypanosome which causes tsetse-fly disease lives in the blood of certain wild animals, such as the buffalo and various antelopes, without evidently interfering with their health; but when transferred by the tsetse fly from the blood of these animals to that of the domestic animals, it causes the death of the latter. Almost all the domestic animals are highly susceptible to nagana, especially horses, dogs, and cattle, and even monkeys, but curiously enough man himself seems to be immune.

In the examination of a supposed case of

this disease, the method of examination is simple. Blood is drawn by means of a hollow needle, from one of the veins of the arm, and this is then centrifuged to get rid, as far as possible, of the red blood corpuscles. When this has been done the clear fluid is decanted off, again centrifuged,

brain, and surrounds the spinal cord so as to prevent damage to these delicate organs. It is easily obtained by introducing a hollow needle between the vertebrae in the lumbar region.

Ten to fifteen cubic centimetres of the fluid are drawn off, carefully centri-



FIG. 4. In the last stages of the disease. The lower part of the body is already dead.

and the sediment now resulting subjected to microscopic examination. But there is another fluid in the body which is more easily examined than blood for such a small parasite, and that is the cerebrospinal fluid. This is a clear transparent fluid which, as is well known, fills the various cavities of the

fuged and the sediment examined. As there are few or no red corpuscles in the fluid to interfere with the vision, naturally the actively moving trypanosomes are very easily detected if present.

There must be some special means whereby the transmission of the trypanosoma

takes place. Sleeping sickness, evidently, cannot be due to the food, as has been suggested nor is there any reason for believing that the parasite is conveyed in food or clothes, or directly from man to man. On

distribution of this fly should be fully investigated, but enough has been done to show that the distribution of this species of tsetse fly is, like sleeping sickness, confined to the shores of the lake and the islands. It



FIG. 5. Negro in last stages of the sleeping sickness. His head has to be held up as he has not strength enough to keep it from falling over on his neck. He is too weak to stand and was placed in the chair for the picture.

the contrary, our studies seem to prove that it is carried by some blood sucking insect. On the waters of Lake Victoria, in Uganda, the tsetse fly is found in large numbers. It is important that the

is on the densely wooded shore of the lake that the half-naked natives of the mainland and islands meet in thousands to trade in fish, bananas, earthenware, etc.

This tsetse fly doubtless carries this try-

panosome from persons suffering from sleeping sickness to healthy animals. The best animal to carry out these experiments on has been the monkey. The method is simply to feed tsetse flies on a sleeping sickness case and, at varying intervals of time,

It is convenient to have, as a rule, about 30 flies in each cage, but only those which fill themselves are to be reckoned as having fed.

As the result of many experiments, it was shown that the tsetse fly is capable of conveying the virus of sleeping sickness



FIG. 6. The tsetse fly which carries the tiniest death mite known to science which cannot be killed by drug or poison—the tsetse as it flies.



FIG. 7. *Glossina palpalis*. The carrier of sleeping sickness.

to place the same cage of flies on a monkey. The sleeping sickness patients do not seem to feel the bites of the flies, as they make no complaints or other signs of inconvenience.

from the sick natives to healthy monkeys. These feeding experiments were made at various intervals of time, and it was found that the tsetse fly can still give rise to the



FIG. 8. A field laboratory at one of the detention camps in which infected tsetse flies are kept to be used in biting monkeys, rabbits, and other animals in order to observe the effects of the human trypanosome on them.

disease at the end of 48 hours, but not longer.

A fly which has fed on a sleeping sickness case, and then kept in a cage without further feeding for 48 hours, is thus capable of transmitting the disease to a healthy monkey, but if kept for three days it is no longer capable of doing so. This proves that the tsetse can convey the infection from the sick to the healthy. But as 28 per cent of the natives of the sleeping sickness area have this trypanosome in their blood, doubtless the tsetse flies caught in this area, which feed on these natives, will be able to convey the disease to a healthy animal without any artificial feeding.

So far, no remedy capable of curing this disease has yet been discovered. We have forced arsenic into the blood of the victims and the trypanosomes have apparently disappeared. Some may have been poisoned, but after a month or so, not longer than six months, the blood tests show that they are again at work and as numerous as before, if not more so.

No other remedy save arsenic has had any effect whatever, and that is only temporary. England, German, Belgium, and France have sent their most noted disease experts to stay the plague.

Dr. Louis A. Seaman, the authority on yellow fever, who, to prove his mosquito theory, slept in beds where victims of the fever had died the same day, has also been through Africa's morass and jungle and risked his life, but to-day he admits that not one remedy has thus far been discovered that will kill all these parasites after they have entered the body of man. The physicians, the bacteriologists are as far away from removing this disease of humanity, as they were when its ravages were first discovered.

## GALL-STONES.<sup>1</sup> Report of two atypical cases.

BY

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Two cases which recently came under my observation direct renewed attention to the fact that oftentimes the symptoms of gall-bladder disease may be exceedingly obscure.

*Case 1.* The first patient, a female aged thirty-six years, was referred to me by Dr. B. C. Frazier with the diagnosis of gall-stones, the history being that for fifteen years there had been more or less continuous discomfort in the upper right abdomen. While there had never been a distinct and well-defined attack of gall-stone colic nor decided jaundice, during the period mentioned the patient had complained of gaseous eructations and abdominal discomfort of greater or minor degree.

Upon examination of the abdomen but little tenderness was detected over the gall-bladder, and no marked symptoms referable to that viscus, there being discovered just enough evidence to make one suspect gall-bladder disease. Coupling these facts with the foregoing history, and the observations of Dr. Frazier, diagnosis of gall-bladder disease was confirmed. At the operation there was removed a single unfaceted stone, brilliant yellow in color, quite translucent to light, ovoid in shape, and about the size of an almond. It is undoubtedly a cholesterol crystal calculus and may have a small nucleus in the center, although in looking through it toward the light no nucleus is observed.

It is evident this calculus had existed for many years in the gall-bladder, and occasionally occluding the cystic duct would cause distension of the viscus with consequent discomfort to the patient. When the distension was relieved, the discomfort disappeared, and she never had an attack of colic. There was but slight inflammatory change (thickening) in the gall-bladder walls, and there were practically no adhesions about the gall-bladder, excepting one very dark and thick attachment near the

<sup>1</sup> A discussion on gall-bladder disease before the Louisville Surgical Society.

neck of the viscus leading toward the duodenum.

*Case 2.* Another patient, a female, aged fifty-six years, came under my observation shortly after the foregoing case, also with the diagnosis made by the family physician of gall-stones. And I must say that I pay particular attention to the opinion of the man who has had an opportunity of examining the patient from time to time. This woman presented a history of pain in the epigastrium with nausea and vomiting developing within an hour after eating. She had lost some flesh and adequate nourishment was impossible because of the rejection of food.

While this case was carefully investigated I came near making a mistake, the history pointing rather strongly either to ulcer or malignant disease of the stomach. Her stool was examined and showed clay colored fecal matter containing an unusual amount of free fat. One of the tests for occult blood in the stool was negative, another positive.

Careful examination of the abdomen was negative, no mass nor enlargement being apparent anywhere. In the first two examinations no tenderness whatever could be detected, but at the third examination slight tenderness was evident on pressure over the gall-bladder region. Suspecting an ulcer or malignant lesion of the stomach, both fleuroscopic and skigraphic examinations were made. A bismuth meal was given and the picture observed, the stomach showing near the pylorus a slight gap or apparent loss of tissue. It was not sufficient, however, to cause retention of the bismuth meal which passed out of the stomach in six hours; but the skigram showed the same picture that was found on fleuroscopic examination, i. e., an excavation near the pylorus. This still did not lead to a positive diagnosis, nor did the one examination in which blood was discovered in the stool. It was my opinion, however, that there must be some trouble about the gall-bladder, because of the facts: (a) that the pancreatic juice was less active than usual, as shown by the amount of free fat in the stool, (b) that the stomach emptied itself very quickly, (c) that tenderness was present over the gall-bladder region, and (d) that bile had been found in the urine. Urinalysis was otherwise negative. While the conjunctivae were barely icteric, the doctor reported that he had seen the patient when she was generally icteric in mild degree. My opinion was not positive,

but was sufficient to justify the suspicion that the patient had gall-bladder disease.

At the operation the gall-bladder was found partially distended, not having entirely lost its blue color; the walls were only slightly thickened, but there was an adhesion leading from near the fundus to the pylorus which I think to a large extent accounted for the picture shown by the skigram. No calculi were detected on immediate palpation of the gall-bladder after abdominal incision and separation of the adhesion, but further manipulation revealed several small stones. The gall-bladder was opened and drained, a number of calculi, none larger than a grain of wheat, being removed.

In the first instance, I was almost ready to permit the patient to return home for further observation before operating upon her, and therefore came near making a mistake. In the second instance, at the operation I thought all the calculi had been removed from the gall-bladder, but to be absolutely sure a wick of gauze was introduced and packed tightly, and upon removal of the gauze a number of small calculi were found adhering thereto. The gall-bladder was again explored and some additional stones were removed with a scoop. Careful examination revealed no further calculi.

The ease with which gall-stones may be overlooked is a very serious thing, as shown by the report of Dr. Finney at the recent meeting of the Southern Surgical Association. He said that in his experience five per cent of cases showed that there was either reformation of stones, or stones that had been left at the primary operation; and in most of these he felt positive the stones were not of new formation, but had been left at the first operation. Stones left in the gall-bladder which has been opened later give rise to symptoms similar to those from which the patient previously suffered, and sometimes result in a permanent gall-bladder fistula.

It seemed to me that these two cases were of sufficient interest to warrant their being reported, as they may help us at some future time in both a diagnostic and therapeutic way.

## A LARGE GALL-STONE.

BY

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About a week ago I was called in consultation to see an immensely fat woman, seventy-four years of age, who had suffered, the family physician said, from obstinate constipation. He enumerated the drugs which he had administered to induce an alvine evacuation without success.

When I saw the patient she had no elevation of temperature, the pulse was about normal,—80 and of good volume,—there was no abdominal distension, and no tenderness anywhere excepting over the gall-bladder region. She had been unable to pass anything from her bowel, so the doctor said, for three days. The patient had vomited the morning of the day I saw her, but only one time. There had been no vomiting since then. The doctor had given her an ounce of castor oil which she had retained, and several saline enemata had been given without effect. I suggested that she be given a milk and molasses enema, and two ounces of castor oil by the mouth; that I believed the whole trouble was in the gall-bladder.

This treatment was instituted and I heard nothing more from the case until today, when the doctor told me that the day after I saw the patient she had a bowel movement which was strained and contained a gall-stone as large as the first joint of the little finger. Since then she has had no further trouble. She had no jaundice at any time.

The question in my mind was how so large a gall-stone could get through without giving rise to jaundice. Did it pass through the duct, or by ulceration into the bowel? I hardly think the trouble was of sufficient duration to justify the opinion that it was passed by ulceration.

Some time ago I saw in consultation a patient who had intestinal obstruction. There was very little distension, but excessive vomiting, and this woman was also operated upon. A gall-stone the size of a small potato had produced complete obstruction, having lodged in the upper part of the small intestine. I could not move it with my fingers, and simply incised the intestine and delivered it in that way, then closed the wound. At that time I investigated the subject of large gall-stones getting into the intestinal tract, and was astonished to find how large stones could pass through the common duct into the intestine, quite as large as the one exhibited by Dr. Sherrill.

## GALL-BLADDER DISEASE.

BY

LOUIS FRANK, M. D.,

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The subject of gall-bladder disease is always interesting. Dr. Sherrill spoke about the formation of gall-stones. Oftentimes no true nucleus is found. Many gall-stones, and particularly is this true of the cholesterolin variety, form primarily as a shell, there being a hollow cavity within the shell, sometimes even with a central opening in the shell, in which the deposition of cholesterolin takes place. Naunyn in his original thesis on gall-bladder disease, which I believe was the first paper calling attention to the different varieties of gall-stones,—and his work is classical on the origin of these calculi,—illustrates these stones beautifully, and goes at great length into the details of their formation.

With reference to the case mentioned by Dr. Roberts: I have a specimen in my collection which I removed from the bowel.

That stone I think found its way into the intestine by the process of ulceration, i. e., from the gall-bladder into the colon. There were no calculi in the gall-bladder, it was a faceted stone, the gall-bladder was empty at the time of the operation, and it produced intestinal obstruction for which the operation was performed. I had the pleasure, several years ago, of assisting the late Dr. Holloway in removing a large gall-stone which had caused intestinal obstruction. Most of these large calculi enter the intestine by the process of ulceration. Some of them may gradually make their way through the common duct, but they are not the large stones which as a rule cause obstruction; they may also ulcerate through the duct into the duodenum without producing markedly distressing symptoms; although these stones have always, so far as I am aware and so far as study of the subject has led me to determine, been accompanied by jaundice at some time in their history. In my own case of intestinal obstruction from gall-stones, however, there was no previous history of jaundice.

I recently removed two very large calculi from an individual who had passed by the rectum a number of gall-stones. The smallest was more than one inch in diameter, and considerable jaundice was present at time of the operation, one of the stones being in the cystic duct, the other in the gall-bladder. There was a fistulous opening between the fundus of the gall-bladder and the duodenum through which the other calculi had evidently escaped.

I also recently operated upon a patient where there was a patent fistulous opening, without any intervening tissue, i. e., a direct communication, between the gall-bladder and the stomach without any stones present in the gall-bladder. This individual had vomited gall-stones which had evident-

ly escaped into the stomach at the time rupture occurred.

One other point with reference to the case mentioned by Dr. Roberts: It should be remembered that intestinal obstruction or obstinate constipation (*obstipation*) in elderly individuals, even without symptoms of acute obstruction, may be produced by gall-stones. Quite frequently these stones are impacted in the lower bowel near the anal orifice and obstruction ensues. Sometimes they may be felt in examining the rectum and can easily be removed. This is one of the things which must be borne in mind,—calculus obstruction as a cause of obstipation, or of chronic or even acute obstructions, occurring in elderly individuals.

With reference to Dr. Sherrill's second case: We ought to be very careful about reading X-ray pictures. I think an ulcer of the stomach which is of sufficient depth with sufficient induration to show a "cutting-out," hollowing, or "punching-out" of the mucosa, discernible either by the skiagram or by fleuroscopic examination, would certainly be of such character that it would not permit of complete rapid emptying of the stomach. If emptying of the stomach occurs within the normal period of time, with a history that may lead one to suspect gastric ulcer, and where the X-ray picture shows a "cutting-out" of the tissues, we should be very careful about making the diagnosis of ulcer, because an ulcer of this duration would of itself produce pylorospasm, or sufficient disturbance would be caused where this cutting-out process occurred to induce pylorospasm and consequent delay in emptying the stomach. Where the stomach empties itself within the normal period of time, there cannot be an indurated pyloric ulcer. Another thing, the normal stomach waves, or contractions, which take place as the stomach empties it-

self, may be easily mistaken for the "cutting-out" due to ulcer. These points should not be forgotten in our skiagraphic reading.

About overlooking gall-stones: This is also a feature which may be well borne in mind. It is my own custom, and I suppose it is the practice with everybody else, that after the gall-bladder has been emptied and thoroughly dried, to pass my finger and palpate the inside of the viscus. This may not be a very good surgical practice, and perhaps should not be recommended for general use, especially in the presence of acute infection, and when it is done we should be most careful to re-sterilize the glove before proceeding with our work. If there is one region which should be protected from possible infection, it is the upper abdomen, and this should be done before the gall-bladder is opened. It has been my misfortune to have gall-stones "get away from me" in the common duct. I have a woman in the hospital now whom I believe has a calculus in the hepatic duct, although I could neither palpate nor find it. I had the common duct practically outside the abdominal incision, by elevating the back of the patient and by lifting the liver forward, and had the duct between my fingers in the foramen of Winslow, yet I could neither feel, discover nor see a place where there could be a calculus. Her jaundice has disappeared, the incision has closed, there is no drainage, still she has no bile in her stools, and I am almost sure she had a stone which disappeared upward into the liver. I have had calculi of this character slip away, and not be able to find them; and I have been fortunate in having such stones pass into the bowel after larger ones were removed from the duct. I recall one individual whose abdomen has been opened two or three times searching for gall-stones which I was never able to

locate. Once or twice the stone seemed to be so situated that I could feel it, but it could never be removed. I even made a trans-duodenal opening and could not reach the stone, and I suppose the patient is still carrying it.

The question of gall-stones is not the simple matter that some of our surgeons (?) would have us believe, nor is it my opinion that the results from gall-bladder surgery are always as brilliant and satisfactory as one would think from reading some of the theses that emanate from surgeons (?) over the country. This has been my experience, and I believe if we would tell the truth about a good many of these cases, we would find that not always do we get the brilliant results indicated by the writings of surgeons generally.

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#### THERAPEUTIC SUGGESTIONS.

Small doses of colocynth meet a defect in nerve force and stimulate it to the normal. The dose must be very small, for in large doses colocynth will produce colic.

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Chronic splenitis and nephritis are conditions in which chionanthus proves a good remedy; also in pancreatic disease, inflammatory or otherwise. Glandular disease with evidence of imperfect waste, often call for its administration. Chionanthus is of utility in uterine and ovarian congestion, when the usual hepatic symptoms calling for it are present.

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For lumbago, foment the back well with hot water, and whilst the skin is red have the ointment well rubbed on, three or four times a day. Sometimes the liniment, composed of two parts of the extract and one part of liniment saponis co., acts better. The patient must be kept in bed for a day or two to give the parts a rest.—*Med. Summary.*

# THE ANNOTATOR

**The School Spread of Contagious Diseases.**—The increasing opinion that infections of childhood are generally if not always contracted by direct contact with a prior case or carrier, has put a new weapon in the hands of those who object to schooling at early ages. The younger the child the more severe are all these diseases, whooping cough for instance being fatal to one in four attacked in the first year, and being almost harmless at twelve to fifteen. Indeed at fifteen, we are beginning to dismiss these diseases as a source of worry. The longer, then, we can keep the children out of school the more chance they have to develop properly and reach maturity. Nevertheless, we doubt whether this knowledge will have the slightest effect on the tendency to begin school earlier and earlier. Medical inspection will be depended upon to recognize and isolate the infected. As a matter of fact, in spite of occasional condemnation of schools as places for the swapping of infections, we are credibly informed that remarkably few cases are traced to school room infection. They are infected from companions in other places as they are well separated in the school room. Sunday schools are coming in for much of the blame and though there is closer contact than in day schools, the churches exercise no precautions whatever and have no medical inspectors. The still closer contact in moving-picture theatres has been accepted as the main reason for some recent epidemics, and health authorities in small communities are even closing the shows on the appearance of scarlet fever and diphtheria in town. This is not practicable in a large city where all the diseases of childhood are constantly present, but



would it not be a good plan to exclude children up to ten or twelve anyhow, and up to sixteen if there is any special prevalence of disease in the neighborhood? By common report, the mental effect of the average photo-play is often very bad in children less than sixteen, and there is not enough good in them to run the risk of infection.

**The Best Age to Begin School.**—For a great many years physicians have been calling attention to the absurdity of educating the brain before it exists.

At six years of age it has not yet attained the final tenth or eighth of its growth, and is utterly incapable of sustained attention, or safe reasoning. Not until the ninth or tenth year is the child capable of

understanding many of the things taught in the lower grades, and might as well be kept outdoors until then. Experience has proved that children unschooled until nine, ten, or even later, make more progress in the end, as though the training before that time had a repressive effect. Every few months and at least every year some physician publicly unburdens his indignant mind and starts the discussion all over again. Nevertheless, mothers obtain so much relief while the children are at school, that the tendency is to send them earlier than ever, not for any educational benefit, but for custodial care and nursing. Though these little tots cannot be drilled in things requiring reasoning, they have excellent memories and they keep their ears and eyes open every minute. They obtain invaluable knowledge of the correct use of language, if they do not get it at home. The public



school system has already assumed the functions of a kindergarten and if we do not look sharp it will soon become a crèche in addition. Why not? Is it too much of a jump to the future socialism to let the state take over the day nursing of our infants in the same way they have taken over the children less than nine or ten who are really nursed more than taught?



**Armor for Soldiers.**—Many years ago several inventors developed bullet proof cloths or breast plates, and in spite of much advertising their suggestions were never adopted—much to the surprise of civilians. The reason is very simple. If the bullet is stopped, its energy is transmitted to the shield which in turn delivers a blow to the soldier's body.

The severity of the blow depends upon the velocity of the shield, and if the shield is very light the chest wall receives more or less injury. In order to be harmless the shield must weigh at least ten pounds. It is a repetition of the old circus trick of striking with a sledge hammer, an anvil on a man's chest. If in place of the anvil we substitute a thin metal plate, the blow would be fatal, and the sledge hammer has about the same energy as a bullet at high velocity. The relative momenta of the sledge and the anvil or bullet and shield enter into the mathematics of it, but need not be explained here. If the shield weighs but six or eight pounds, the blow of the bullet almost knocks a man down. The cloths consisted of expensively woven cotton and wire, and of course were rejected because cheap steel plates of the same weight were equally effective. The latter have been adopted, not to be carried all the time since the weight is prohibitive, but for occasional protection lying down between advances before trenches. That is, soldiers are not to wear armor but to get behind it, as in armored ships, forts and motor cars. This probably explains the report that armored breast plates are being adopted. A breast plate would stop or deflect only a small percentage of possible hits anyhow, but a shield is a good protection to one lying down.

**Bad Teeth and Moral Delinquency.**—Defective physical development has been almost certainly proved to be the primary cause of much anti-social conduct, particularly of boys and perhaps girls also. Back of that is the influence is apparently deficient and the chief of all its factors is apparently deficient and poor food. Misdemeanors and crimes are being traced

back to a material basis. The delinquents are not able to act normally. Psychologists have found that arrested or delayed mental development is almost the rule among youthful criminals. Of course some may have been taught to be bad, but the large number of splendid citizens who were raised in the slums shows that we have vastly overestimated the environment's moral effect upon the healthy. It seems that the baneful teachings of bad companions are effective in proportion to the badness of the pupil's physique. Such a boy or girl could be taught to be good but might easily fall under temptation in adult life. The prevention and cure of moral delinquency has therefore been drifting from the hands of moralists to those of physicians. The earlier the treatment begins the better the results. One of the main effects of bad development, bad nutrition and infection in childhood, is the defective nature of the materials in the teeth. They are practically never good in such unfortunates and of course they increase the damage by interfering with mastication and by constant poisoning from the numerous pus foci they harbor. One of the most satisfactory parts of school hygiene is the attention given to the teeth, and now we learn that such good results have obtained in young delinquents as to have created the opinion that defective dentition is in reality the main cause of their immorality. This is going a bit too far, but no harm can result if any reformer does think so, for it will direct attention to the ultimate cause and perhaps lead to prevention of some of it, though we do not know where we are to get the money or food to nourish the great mass of babies of the submerged tenth. Sad as it seems, some must go hungry, become physical defectives and drift to the reformatories to be patched up as far as our means permit.

**Is Charity Misplaced?**—Charity's neglect of the fittest is beginning to be resented. More and more often do we notice in current literature, statements to the effect that we are wasting good money by spending it on the lowest tenth—those submerged by their unfitness to survive in this environment. If we boost them up into the self-supporting class, they will



slip back unless we hold them up, and we are thus creating permanent social burdens. There is most resentment at the prevalent policy in school management, to establish special classes for the backward who will never amount to much no matter what we do for them, while the absolutely normal children are herded together without the slightest effort being made to classify them according to their special mental needs. No two human beings are exactly alike, and no two require exactly the same training. The variations are so extreme that the instruction for some may be actually injurious to others. Even "scholarships" instead of being given to those who will most profit by them, are all too often reserved for those whose only qualification is poverty. Instead of being great honors sought after by rich and poor alike as in foreign universities, they are here frequently tainted with some kind of opprobrium which makes the holder conceal the fact that he possesses one. Real men are ashamed of receiving charity, but proud of achieving a scholarship. Most of these criticisms are too extreme, though there is a grain or two of truth in them which should make us pause. The basic principle of civilization is to get the best out of everybody, and not to let any one become utterly useless, and above all, we must prevent burdens—not increase them. Still, we ought to consider whether or not we are spending too much time and money on those who will give the least social return, and whether it would not be better to give more to the normal. Are we not carrying education too far with those unfit to profit by it? Are we not doing more harm than good by keeping underfed children in school when they should be out making their living? Would not the social returns be more if the super-normal were helped a little bit? There are indications that Eu-

ropean nations are trying to prevent the emigration of their best and are doing it by helping them stay at home. Why not help our best men in college and see that their talents are used later?

**Unnecessary Surgery.**—At the last meeting of the American Medical Association, Dr. John B. Deaver of Philadelphia protested against the large amount of unnecessary surgery. He claimed that he had investigated many abdominal operations and had found them to have been unjustified. He was strongly supported by Dr. Charles Mayo of Rochester, Minn.

When two such men "speak out in meeting" this way, it is time for the rest of us to take notice. One of the remarkable features of a certain surgical clinic in this country, is the large number of applicants for operation who are sent home with the information that none is needed. There are rumors that in other places none escape. We hoped these rumors were largely fabrications and we hitherto ignored them, but now that such high authority has spoken we have justification for mentioning them. The question naturally arises as to who is the proper judge as to the necessity for an operation, the man who gets a big fee for doing it or he who gets a little fee for advising it? Deaver says that no operation should be attempted except by the joint advice of a board of consulting physicians and surgeons, and intimates that the verdict should be unanimous. This is good news, for we have long felt that physicians have been leaving the matter too much to the surgeon's judgment. The internist should be the best diagnostician and ought to know what things need mechanical remedy and the results of surgical treatment. The surgeon is theoretically the mechanician but has assumed the diagnostician's role with alleged disastrous results. These straws seem to show the drift back to be old status of having the physician assume control of the case from beginning to end, and hiring a surgeon for mechanical work in the same way he would hire a dentist, who is really a surgeon with such a limited field that he



never dares to assume control of a case. The fee should go to the physician who will pay the surgeon for his services. The great ability and scientific attainments of successful surgeons may prevent this drift, however, as we instinctively trust the judgment of such men.

**Less Meat for Americans.**—The changing dietary of Americans has received much needed attention from Prof. J. F.



Lyman of the Ohio State University. (*Popular Science*). He shows that our population has increased so much faster than the food production, that we are slowly ceasing to be a food exporting nation. The war has greatly stimulated

exports but in the thirteen years ending 1912 our exports of wheat declined 57 percent, corn 80, pork 30, beef 65 and cheese 85. It seems safe to predict a time when we will cease to export any because we will consume it all ourselves. Indeed we are beginning to import as we have repeatedly mentioned. Meat as a steady diet is already out of reach of the poorest and will become an occasional food as it has been in parts of Europe for a long time. We will get our nitrogen in other ways. Perhaps this will be a benefit, for we were the greatest meat eaters in the world and have perhaps been overgorging ourselves as not a few physiologists assert. We are at last face to face with what Malthus predicted, but which we have denied because delayed. The great food supply of the new world had not been drawn upon when he made his wonderful discovery. It has increased population in Europe enormously, yet immigrants come here to eat the food recently exported. Now that the land is occupied and immigration checked, trade is necessary. It is no mere coincidence that all Europe was in arms at the very time we began to check up our food exports and competed with it for trade. The emigration outlets for surplus population are closing and they are faced with the dilemma to starve or to die fighting for food or trade. Brutal facts must be faced and not denied in our horror at bloodshed.

## THE AMERICAN FUND FOR BELGIAN PHYSICIANS.

### REPORT OF COMMITTEE.

The announcement in the October issue of *AMERICAN MEDICINE* that this publication would undertake—in response to an urgent demand—the collection of a fund for the physicians of devastated Belgium, was greeted by words of commendation and approval from one end of the country to the other. It was evident from the first that great sympathy was felt for our afflicted Belgian brethren, and that many would welcome the opportunity of aiding any movement looking toward their relief.

The following committee was appointed and as stated in our last month's issue, the whole project has been under its direction:

#### COMMITTEE.

Wm. Seaman Bainbridge, M. D., New York; H. Sheridan Baketel, M. D., New York; Otho F. Ball, M. D., St. Louis; J. Wallace Beveridge, M. D., New York; Louis F. Bishop, M. D., New York; Samuel Horton Brown, M. D., Philadelphia; A. S. Burdick, M. D., Chicago; W. P. Carr, M. D., Washington; Henry W. Coe, M. D., Portland, Ore.; David M. Cowie, M. D., Ann Arbor; T. D. Crothers, M. D., Hartford, Conn.; Howard Crutcher, M. D., Roswell, N. Mex.; Charles J. Drueck, M. D., Chicago; Charles Wood Fassett, M. D., St. Joseph, Mo.; Samuel G. Grant, M. D., New York; Bayard Holmes, M. D., St. Louis; Frank C. Lewis, M. D., New York; Smith Ely Jellife, M. D., New York; LeGrand Kerr, M. D., Brooklyn; Bransford Lewis, M. D., St. Louis; Frank C. Lewis, M. D., New York; J. MacDonald, Jr., M. D., New York; H. O. Marcy, M. D., Boston; Ellice McDonald, M. D., New York; Douglas W. Montgomery, M. D., San Francisco; Robert Tuttle Morris, M. D., New York; Wm. H. Porter, M. D., New York; Beverley Robinson, M. D., New York; Chas. E. De M. Sajous, M. D., Philadelphia; Parker Syms, M. D., New York; E. A. Vander Veer, M. D., Albany, N. Y.; I. W. Voorhees, M. D., New York; Ralph Waldo, M. D., New York; Claude L. Wheeler, M. D., New York; Orrin S. Wightman, M. D., New York; Reynold Webb Wilcox, M. D., New York; Henry Smith Williams, M. D., New York; Chas. E. Woodruff, M. D., New Rochelle, N. Y.; H. Edwin Lewis, M. D., Secretary for the Committee, New York City.

Although reluctantly, the editor of this publication has agreed to act as Secretary of this Committee and attend to all records, reports, correspondence, etc.

Immediately after organization of the foregoing Committee, steps were taken to get in touch with the National Committee in charge of the general Belgian



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Escorting the wounded from Ostend.



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Belgian Red Cross Division bringing wounded into Ostend.

Fund, with the purpose not only of assuring them of our desire to cooperate with them in every way, but also of obtaining their advice as to the best way of getting aid to our Belgian confrères. The following letter from the Rev. J. T. Stillemans is self-explanatory:

New York, Nov. 10, 1914.

H. Edwin Lewis, M. D.,  
Editor AMERICAN MEDICINE,

I want to tell you at once that I think it is a splendid idea for the American physicians to come to the rescue of their Belgian brothers. Perhaps the doctors in Belgium are suffering more than any one else, for besides the general suffering in which they share they undoubtedly are called upon to do any amount of work. Our committee is sending supplies to Belgium and, of course, these supplies are distributed to the entire population, but I would suggest that any money collected by the American doctors be sent by us to the American ambassador in London, to be turned over by him to the General Medical Society which exists in Belgium and of which all doctors are members. They can then dispose of the money as they deem best.

Hoping, dear sir, that this arrangement will be satisfactory, I am,

Yours sincerely,  
J. F. STILLEMANS,  
President, Belgium Relief Fund.

Following the suggestion given by Mr. Stillemans a check for \$700 has been sent to him with the request that this be placed in the hands of the Relief Committee of the General Medical Society of Belgium for use in ways deemed most effective for meeting the needs of afflicted physicians and their immediate dependents. As additional sums are collected they will be forwarded through these same channels.

Private communications that have been received in this country tell in no uncertain way of the destitution that has come to the major proportion of the physicians of ruined Belgium. Lack of space precludes repetition of tales of anguish and affliction that bring tears to the eyes of all who read them. Suffice it to say that many of our Belgian colleagues are in direst need. Without resources and with their patients impoverished and starving, their situation is indeed serious. It would be bad enough if they were only called upon to bear the loss of their libraries, instruments and equipment generally, but many of them have had to witness the demolition of their homes

with all their wearing apparel and personal belongings. Therefore, it takes no vivid imagination to picture the destitute condition in which many a Belgian physician and his family find themselves. Add to this the complete collapse of commerce and trade, the cessation of the usual methods of financial exchange, and one can readily understand the stunned, crushed, almost apathetic state which is said to characterize doctor after doctor, as they go on ministering to the needs of the wounded or sick. This is hardly to be wondered at when we stop to think how suddenly this calamity came to prosperous, happy Belgium. All of the foregoing would be sufficient to inspire the deepest sympathy and lead us to come to the aid of our Belgian colleagues, but a much graver and more urgent need has presented itself. The most terrible feature of the Belgian holocaust is the fearful shortage of food. The suffering entailed by insufficient clothing, shelter and warmth at this time of the year makes our hearts ache but it is the hunger and actual starvation that these afflicted ones are undergoing that fills us with horror. Does it seem possible that such a condition could possibly develop in this year of Our Lord, 1914? Is there a doctor in this fortunate land of ours who can contemplate the affliction that has come to his fellow workers in Belgium and think of the physical woes they and their families are being forced to undergo, without feeling the deepest sympathy? Can one think unmoved of the awful anguish and despair that will fill the hearts of these Belgian doctors when their little ones, cold and underclad, cry and plead for food which they cannot give to them? Is there one in all our land who will not want to add some small amount to the fund we are collecting for the purpose of helping to relieve this frightful condition?

The responses made to our plea for our Belgian confrères have been exceedingly gratifying.

The contributions recorded later on are those received in response to the editorial plea in last month's issue of AMERICAN MEDICINE, and a letter sent out to a select list of one hundred leading medical advertisers. Inasmuch as it was known that all, or nearly all of these advertisers had al-



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ENEMIES ON THE FIRING LINE BUT FRIENDS AT THE SIDE OF THE WOUNDED.  
The chief German physician of the Reserve Hospital in Berlin and a French military surgeon on a visit through one of the wards.



*Copyright by International News Service.*  
A scene in the Military Hospital at Ghent.

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ready contributed to the General Belgian Fund, our Committee asked for only one dollar from each one addressed. The replies were prompt and cordial and a goodly number gave a larger sum than was asked for.

The Committee have also sent out letters to a few of the country's foremost medical journals, seeking their cooperation and aid. Here again the response has been splendid and these publications have shown a hearty sympathy with the project and a desire to promote its success that speak more eloquently than words of the spirit of fraternity and kindness that dominates the policies of our contemporaries. Almost without exception every journal written to has pledged its active cooperation, not only editorially, but also through publication of an advertisement, calling attention to the needs of Belgian physicians and this movement in their behalf. Owing to the time of the month that the Committee's letter went out to the medical journals, their assistance can not be given until their December issues begin to appear. Then, as the whole American profession learns of this plan to help our Belgian brothers, the American Fund for Belgian physicians will grow steadily.

One of the pleasantest features of this undertaking has been the many kindly letters received from almost every city and state in the United States. We would like to print every one received for there is not one that does not carry some special interest. But lack of space prevents us from printing other than the few that follow.

Nov. 5, 1914.

Editors AMERICAN MEDICINE,

New York City,

My Dear Colleagues:

I just read your editorials on "Our Belgian Confrères" and must confess I was really touched by your words. While it is supposed that you know on which side I stand in this most terrible of all the wars, being a native and great admirer of Germany, I feel just as much for Belgian and other sufferers as for the German ones. Having contributed already to some extent to German collections I hope you will pardon the smallness of my check that is to go towards the relief of a profession that is always ready to help others, but very seldom accepts any relief whatsoever from outsiders.

My best wishes for your worthy enterprise.

Fraternally yours,

W. FREUDENTHAL.

Buffalo, N. Y., Nov. 5, 1914.

Belgian Medical Committee,

Dear Sirs:

Enclosed find P. O. order for \$10 to apply to relief of Belgian physicians.

It gave me great pleasure to read the editorial in last issue of AMERICAN MEDICINE as it was most judicious and timely.

Wishing you every success in your efforts to relieve the distress of those noble Belgian physicians, I remain

Sincerely yours,

E. M. DOOLEY.

Roswell, New Mexico, Nov. 8, 1914.

Dr. H. Edwin Lewis,  
New York City,

My dear Dr. Lewis:

Your kind letter of the 2d instant is deeply appreciated. Before its arrival Mrs. Crutcher and I had been earnestly at work, although it is our rule never to appear in the local prints when we can avoid it.

The enclosed clippings from our local papers will show that our little oasis in the "Great American Desert" is up and doing in the matter of relieving the distress of the stricken Belgians, whose sufferings must appeal to all who have a heart to feel sympathy with the afflicted. If the very Devil himself is not in chief command he is certainly in touch with headquarters.

You may be sure that I shall appreciate whatever you may find time to send to me. Although I receive *The Times* every day, I fear the half has not been told.

With old-time regards,

Yours as ever,

HOWARD CRUTCHER.

Nov. 5, 1914.

The Belgian Medical Committee,  
18 East 41st St.,  
New York.

Dear Sirs:

In immediate response to your soul-stirring appeal in AMERICAN MEDICINE for our Belgian confrères, enclose my check for the modest sum of \$5.00

May Heaven bless you for having suggested this very practical way of expressing our heartfelt sympathy for our bereaved brethren in poor Belgium.

Very truly yours,

E. A. CHARON.

By Telegram.

San Francisco, Cal., Nov. 16, 1914.

H. Edwin Lewis, M. D.,  
Editor AMERICAN MEDICINE:

Your appeal for space in the *Pacific Medical Journal* to announce the collection of funds for our stricken Belgian confrères is cheerfully granted. I am also sending you one hundred dollars as a personal contribution to the American fund for Belgian physicians.

WINSLOW ANDERSON,  
Editor *Pacific Medical Journal*.

November 16, 1914.

Belgian Medical Committee,  
New York City,  
Dear Sirs:

I enclose a second check for your work, as on consideration of its object, the philanthropy and appropriateness of a special fund for this purpose, appeals very strongly to me.

Is there any pursuit which entails harder work, more self-sacrifice, and conscientious labor than that of the medical profession?

A truly devoted and sincere doctor would perhaps suffer greater hardships than any other class in Belgium, since in addition to his own deprivations he must constantly be striving to relieve others.

Wishing your work unbounded success, I am  
Sincerely yours,  
CORNELIA MINOR ARNOLD.

Nov. 10, 1914.

Dear Dr. Lewis:

Enclosed please find little check for the Belgian Physicians' Fund. I believe the medical profession owes you thanks for giving them the opportunity to aid their sorely tried Belgian colleagues. Whatever opinions may be as to the merits of the various belligerent nations, nobody will have the hardihood even to question that Belgium has been an innocent victim, and now she is the greatest sufferer, ravished, famished, crushed, trampled upon, her soil soaked with blood and her rivers choked with corpses, the whole population driven to frenzy by the tortures and sufferings that they have had to undergo during the last three months.

The whole world should unite in aiding poor stricken Belgium before any other of the belligerent nations. We may not be able to do much, but the little we do may save our colleagues from actual starvation, and that means a good deal.

With best wishes for the success of your humanitarian enterprise,

Sincerely yours,  
WM. J. ROBINSON, M. D.

Nov. 9, 1914.

Gentlemen:

Your editorial is magnificent. It should make us all sit up and take notice.

I enclose my small offering.

Very truly,  
J. S. WINTERS.

Farmington, Iowa, Nov. 10, 1914.

AMERICAN MEDICINE,  
New York City,

Dear Sirs:

Just read appeal for Belgian physicians. Enclosed find \$1.00 for Fund. Hope it will do some doctor or his family some good. My heart goes out to those distressed people, and especially the doctors and their families.

Fraternally yours,  
G. R. KEFF.

My Dear Confrère,

Editor of the Journal, AMERICAN MEDICINE:  
I have received this morning the October

issue of AMERICAN MEDICINE and I hasten to send in at once my contribution for this worthy purpose of relieving our beloved colleagues of Belgium.

Honor to the man who leads this noble work!

Fraternally,  
DR. THEO. J. JACQUEMIN,  
506 Clinton Avenue,  
West Hoboken,  
New Jersey.

Toronto, Can., Nov. 9, 1914.

Dr. H. Edwin Lewis,  
New York, N. Y.

Dear Doctor Lewis:

I have read with peculiar interest your letter to the Journal under date of November 6th, in reference to a magnificent and patriotic movement on the part of yourself and your Committee to inaugurate a Fund in aid of the Belgian physicians. As you know, Canada has been fairly racked for the past three months regarding the awful European war, and the number of Funds that have been started in Toronto alone are legion, the Dominion having determined to do at least its share in aiding the mother country in this Her hour of stress. We have Patriotic Funds of almost every description, and Ladies' Committees to no end.

I feel, however, a peculiar interest in the movement which you yourself have started, and with all my heart wish it God speed. The suffering in poor old Belgium must be something dreadful, and the heroism displayed by every Belgian from King Albert to his meanest subject is nothing short of grand, and I don't suppose there is a nation in the world who would not be glad to take some part in aiding a country laid waste through no fault of its own. I heartily congratulate you upon the movement now on foot to do something toward assisting the Medical Profession throughout Belgium to once again get on their feet, and anything that I can do through the pages of *The Canadian Journal of Medicine and Surgery* will be done with the utmost pleasure. Though I cannot promise to make editorial reference to this movement in our December issue, it now being all in type, I will see to it that this is done in connection with our January number, to be out about December 20th.

With kindest personal regards.

Sincerely yours,

W. A. YOUNG.

New York, 42 West 37th St., Nov. 8, 1914.

Dear Doctor Lewis:

I hope and pray most sincerely that sooner, or later, afflicted, desolate Belgium may have some respite from woe and terror. Alas, the pity of it!

Yours very sincerely,  
BEVERLEY ROBINSON.

Nov. 5, 1914.

Dear Dr. Lewis:

I am in receipt of your esteemed favor announcing the campaign for the relief of the Belgium physicians. It is needless to say that I am in hearty sympathy with the move-

ment and hope that you will succeed in raising a respectable fund for the purpose. Enclosed you will find my check, and I am very sorry that I cannot make it larger. I shall take pleasure in calling attention to the matter in the next issue of the *Medical Herald*.

Yours very truly,  
CHAS. WOOD FASSETT,  
Mgr. Editor.

Willow Springs, Mo., Nov. 7, 1914.  
Editor AMERICAN MEDICINE,

New York, N. Y.:

Enclosed find check for relief of Belgian physicians. If all physicians who can will give a like amount it should be sufficient to do much good. However, I shall be glad to double the amount if necessary. And I want to congratulate AMERICAN MEDICINE for doing the right thing at the right time. With best wishes for the success of the movement, and for AMERICAN MEDICINE, I am

Very truly yours,  
H. J. ROWE.

Cinti, Nov. 10, 1914.

AMERICAN MEDICINE:

Your undertaking to help our distressed and impoverished brethren is most worthy and humane, I am pleased to contribute, if it is only a small amount, to aid our fraternity.

The Belgian physicians have proven themselves to be true and loyal men, sacrificing everything for humanity and their country.

Fraternally yours,  
I. D. JONES, M. D.

Bancroft, Idaho, Nov. 12, 1914.

Dr. H. E. Lewis,  
New York City,  
Dear Doctor:

Your editorial in the current issue of AMERICAN MEDICINE on fund for Belgian physicians is straight to the point and is worthy of the support of all American physicians. It is to be hoped that the responses will be prompt. Enclosed you will find my personal check.

The plight of the Belgians must appeal to the sympathies of all classes of peoples and that of the physicians of that wretchedly harassed country must appeal to their brothers all over the world. It is our earnest duty to do our part in response to your request and freely and willingly.

With kindest regards, I am  
Fraternally yours,  
R. J. SMITH.

Butler, Pa., Nov. 6, 1914.

My Dear Sir:

I have just been reading your appeal for the physicians and their families of Belgium. I want to thank you for this article. It is timely, sincere, and sets forth the condition in a way that will appeal to the hearts of all readers.

No doubt, also, that it will crystallize the feelings of very many physicians into a practical effort to do something at once. I enclose herewith a small check (not at all in propor-

tion to my sympathies or desires), for whatever relief it may bring. I am sorry it is not larger.

Sincerely yours,  
L. L. DOANE.

The foregoing will serve to show the general attitude towards this movement. The following list of contributions include those made up to the time of going to press. The period covered has been therefore only about twenty days. Additional contributions will appear in our December issue.

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In closing this report we wish to emphasize the fact that unlike many charitable movements there are no expense items to be charged against this Fund. In keeping with its policy AMERICAN MEDICINE will cheerfully bear all administrative expenses attached to this work for the physicians of Belgium. Every dollar contributed, therefore, will go to fulfill the purpose for which it is given.

The Committee in charge of the American Fund for Belgian physicians wish to take this opportunity of earnestly thanking every one who has cooperated with them in any way. As far as possible acknowledgment has been, or will be made of every contribution. Likewise every letter or communication will receive prompt reply. But owing to the large amount of detail essentially connected with this undertaking delays may be occasioned. We accordingly ask our friends to be tolerant in the event of our failing in any particular. To the editors of the many journals that have promised us their active aid and support we also wish to express our sincere appreciation. It is noble, kind and generous to cooperate with us so heartily in this work, and in the December issue of AMERICAN MEDICINE full credit will be given to every publication that has responded to our appeal.

We hope that every medical man who has not made a contribution to this Fund will send in something as soon as possible—*if it is only a dime!*

The American people are doing a great deal for the Belgians but we do not begin to grasp the magnitude of the problem. The real gravity of the situation in war ridden Belgium comes from the fact that the usual and ordinary ways and means of every day life have been swept away. As a result something over seven million human beings are left like little children without either sustenance or the opportunity of earning it, and, as a consequence totally dependent on

the outside world for the means of keeping the spark of life in their bodies.

The physicians of Belgium suffer the common woe, but owing to their identification with relief measures, their own needs are very apt to be overlooked. Medical men rarely ask anything for themselves until the wants of all others are satisfied, and this is why it is necessary to collect funds to be devoted especially to the needs of afflicted Belgian physicians. Unless adequate relief is thus provided, and very soon, it is certain that many of our colleagues are going far down into the Valley of the Shadow. Some may come back, many will not, but all will go through suffering and misery such as the civilized world has never seen. Surely no one can think of the experiences our Belgian brothers have been forced to undergo during the past three months, and contemplate the state of their unhappy land without feeling a great sadness. With the opportunity, therefore, before us of lightening the burden of our sorrow laden colleagues in Belgium, let us not neglect it.

In this connection we have noted with much interest that the medical men of Great Britain have also recognized the urgent need of Belgian physicians and are planning to help relieve the suffering and distress that are so evident. This is splendid, but in no way alters or lessens the obligation that confronts the American profession. In reality the action of our British brethren merely accentuates our own duty and emphasizes the urgency of the situation.

Every medical society or body of physicians in the United States ought to join in this work. The noble action of the group of Des Moines physicians who united their forces and sent in a contribution should serve as an inspiration to doctors in many other cities. It is deeds like these that show the true spirit of humanity and give us new faith in the innate kindness of mankind. A further report showing the progress of the Fund for Belgian Physicians will appear in our December issue.

Respectfully submitted,

H. EDWIN LEWIS,

For the Committee in Charge of the American Fund for Belgian Physicians.

## ETIOLOGY AND DIAGNOSIS

**Estimation of Uric Acid in Urine.**—Bernard (*Apoth. Zeit.*) claims that the following method for estimating uric acid is very accurate and expeditious. The urine—100 c. c. (mils)—previously deprived of albumin, is mixed with 4 grammes of ammonium chloride and the mixture is allowed to stand for three hours. The precipitate is collected on a filter, washed with hot strong alcohol, and is then dissolved on the filter with 30 c. c. (mils) of tenth-normal potassium hydroxide. The filter is washed four or five times with small quantities of hot water and the combined filtrate and wash-water is then boiled until the vapors no longer turn red litmus paper blue. The excess of alkali is then titrated back with tenth-normal sulphuric acid, using phenolphthalein as indicator. Each c. c. (mil) of tenth-normal potassium hydroxide corresponds to 0.0084 gramme of uric acid.

**The Urine During Pregnancy.**—J. H. Beard (*Illinois Med. Jour.*) concludes his valuable article as follows:

1. In pregnancy, so-called physiologic albuminuria should be regarded as indicative of renal abnormality and the patient watched accordingly.

2. Recognition and differentiation of the different types of albuminuria are imperative in order that the members of the toxic group may be discovered early, their gravity appreciated, and proper treatment instituted.

3. The infectious and mechanical types should be carefully observed to detect developing nephritis and to avoid any increased irritation of the renal epithelium.

4. Melituria during pregnancy, in the absence of clinical symptoms, should by no means be interpreted as a sign of diabetes until lactosuria, alimentary and transient glycosuria have been excluded.

5. In the absence of symptoms it may be impossible to determine whether a given case of glycosuria will or will not clear up under treatment. When glycosuria is present and it does not appear to be alimentary, careful and repeated observation of the patient is absolutely necessary.

6. Very low urea output is a danger signal and the patient should be kept under close supervision.

7. High ammonia may be due to increased total nitrogen eliminated, following nitrogen retention, inanition, catharsis, etc., or it may

also result from bacterial contamination of the bladder, and may be unaccompanied by any unfavorable symptoms.

8. No great emphasis should be placed on percentage values in determining a radical course of clinical procedure, but we should be guided by the symptoms, as well as, the urinary findings.

9. Analysis of the urine is a means of great value in separating the safe from the hazardous cases, and while it may not tell when to empty the uterus, it should lead to the use of such diet, hygiene, and medication that intervention in many cases would be unnecessary and many children would be born that otherwise would have been doomed.

## TREATMENT

**Sodium Succinate in Liver Disorders.**—Sodium succinate has been recommended, says R. J. Smith, (*Medical Summary*, Nov., 1914), in cholelithiasis, cholangitis—in all catarrhal conditions of the biliary passages. It is not a remedy for the paroxysms of pain. It is the remedy for the condition back of the attack of colic. Given in 5-grain doses before meals and at bed-time, continued for months, it prevents the attacks or lessens their severity, the attacks becoming less severe and farther apart until they cease altogether.

This remedy does not take the place of surgical interference when this is indicated. If there is a gall-stone dyscrasia an operation does not always cure. There is left the condition predisposing to the formation of gall-stones, and it is against this condition that sodium succinate finds its greatest field.

That it does act in these cases clinical reports seem to prove. In Smith's practice, there have been cases which showed its beneficent action very strongly.

One case under treatment at the present time, is relieved while taking the remedy religiously. If the patient stops the remedy in a week pains in epigastric region return, spreading to gall-bladder and through to the angle of the scapula. The pain is controlled in a day or two on resuming her medication.

In another case, after operation and removal of over one hundred calculi, the patient had recurrence of attacks of pain within three months. The use of sodium succinate removed the pain, prevented gas eructations and vomiting, and increased digestion. The author believes it acts on the biliary passages. That it relieves is certain.

# American Medicine

H. EDWIN LEWIS, M. D.

EDITED BY

and

CHARLES E. WOODRUFF, M. D.

PUBLISHED MONTHLY BY THE AMERICAN MEDICAL PUBLISHING COMPANY.

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Complete Series, Vol. XX, No. 12.  
New Series, Vol. IX, No. 12.

DECEMBER, 1914.

\$1.00

YEARLY  
in advance.

**Hetero-plastic grafting of testicles** has been successful in cases reported by Drs. G. Frank Lydston of Chicago and Robert T. Morris of New York (*N. Y. Med. Jour.*, Oct. 17, 1914, *et seq.*). The tremendous importance to the body of the internal secretions of the ovary and testicle has been known for ages, though it was only recently that the effect has been ascribed to a secretion. The results of removal of the ovaries have been so disastrous that our temporary mania for removing healthy ones soon came to an end, and was replaced by a desire to retain as much of them as possible when disease necessitated their partial removal. In 1895 Morris introduced the method of grafting the ovary on some other spot. Then came the attempt to graft an ovary from some other person, but the tissue was generally absorbed. Only occasionally did the recipient nourish the new tissue. Both Lydston and Morris conceived the idea of grafting the testicle. The former cured a case of obstinate psoriasis so promptly as to leave no doubt that the graft did it. The latter was lucky enough to have a case of hernia willing to give up testicle tissue for grafting on a patient who had lost both glands as a result of injury and in whom serious nervous disturbances demanded relief. The operation was done last February

and reports for the next five months show not only relief of the nervous symptoms, but a marvelous restoration of sexual function. Lydston also operated successfully on himself—another instance of self-sacrifice in interest of humanity. He selected the scrotum, but Morris used both the scrotum and the sheath of the two rectus abdominis muscles. A direct blood supply is unnecessary as the serum in the tissue is sufficient nourishment at first. These pioneers have evidently opened a new field.

**The importance of the generative internal secretions** must inevitably lead to practical means of curing the conditions due to defect or total deprivation of the glands. Lydston's scholarly review of the literature of this subject and his own keen observations leave no doubt that hypo-orchidism, if we may coin a term, is as important as the hypothyroidism discovered by Hertoghe. There is a vast unexplored field here, particularly among the defective classes. It is more than a pity that the natural repugnance to the investigation of sexual anomalies has so long hampered this branch of medicine, for the evidence indicates that defective development of ovary or testicle is responsible for much suffering and disease which have ruined what otherwise

might have been happy useful lives. The nervous system needed this stimulant, and perhaps Lydston is correct in his surmise that this defect may make the whole system less resistant to tuberculosis, diabetes, malignant disease or any chronic complaint indeed. Even dementia praecox is suspected. We quote Lydston's conclusions in another column. The term *hormone*, an awakener or exciter, proposed by Bayliss and Starling for the whole group of internal secretions whose sole duty is to regulate the activities of other organs or tissues, thus seems destined to appear in the literature with increasing frequency now that we have made a successful start in therapy. We hear for instance of remarkable results of the use of extracts of the mammary gland in uterine hemorrhages of ovarian origin. The actual chemical substances will eventually be isolated and manufactured, as in the case of adrenalin, so that they may be introduced into the system daily the same as food. It will be no more trouble than the morning cup of coffee. Organotherapy is emerging from its long unjustified disgrace. In the meantime we must develop transplantation for it is a simple matter to preserve the vitality of these organs out of the body a long time, ready for use when needed. Glands from lower animals might be just as good as the human if we knew how to treat them, but at present we must use the latter from the recently dead or from patients who must be deprived of them for other reasons.

**Hyper-orchidism**, though invariably treated as a joke, now assumes the same pathologic importance as hyperthyroidism. Men otherwise normal have been ruined by it, brilliant careers have been shattered and families broken up. Unhappily it re-

spects no class, for it seems to afflict some of the ablest as well as the feeble-minded—and it probably has led some to do murder. Perhaps talented men suffer more than the weak. Surely it is worth scientific study, for even if it is impractical to treat it now, someday we may need to know how. Besides, the penalties we now visit upon them should be tinged with the same pity we give to sufferers from hyperthyroidism, for we are sure to find physical abnormalities from an excess of these hormones. We have no names for what might be called hypo-ovarianism and hyper-ovarianism, but the conditions seem to exist and perhaps are just as disastrous as the similar status in the male. The relation of all these states to unhappy marriages is an old story to sexologists, but the public does not yet suspect the pathologic basis of many a separation and divorce. What a blessing if appropriate hormones could make happy families of the unhappy and lessen the work of the criminal courts. The relation of excessive sexism to prostitution is frequently denied, but there is room for better studies than those upon which the denials are based. Are we dreaming too much if we think of such a scientific way of lessening or ending humanity's greatest blot? Could not the lay press do some good by at least hinting at the abnormal physical basis of all abnormal-individual and social phenomena? The subject is scarcely fit to print as family news, but does not the end justify the means a little bit sometimes? Puritanism does not forbid enlightenment though most men think that ignorance is innocence. The modern press is liberal enough to do a little towards this education, and still be admitted to the mails. We object to the premature enlightenment of children, but adults ought to know it. How can we tell them?

**The socialistic trend of medical service** has been noticed all over the civilized world, but there seem to be few who realize how far we have gone in this direction already. Mr. George McAneny, president of the New York City Board of Aldermen, in an address to the Academy of Medicine, (Nov. 19, 1914) discussed the partnership between New York City and the medical profession. He said that there are 650 physicians on the pay rolls with aggregate salaries of \$881,000. Including the 982 who serve in some capacity without pay, the public receives official service from 20% of the local medical profession. If we add those who serve with nominal or no salary in private institutions, we might be safe in estimating that fully a third of the profession officially serves society in some way without cost to the individual sick man. This does not count the unofficial charity work of the other two-thirds. People found out long ago that they could educate their children better by combining, and the teachers joined in because the pay was better than in the private schools of a century ago. We now think that public education is a personal right, though as a fact it is only a scheme for increasing social efficiency. Most of us think that all children must be educated. By the might of majority rule we force education on them whether the parents agree to it or not. We may be wrong in this extreme position, and we know we are wrong in some of the things we teach, but there is no question that it is the state's duty to educate all whose parents desire it. There is some analogy in all this to the duty of the state to furnish medical service for the purpose of making the disabled self-supporting as soon as possible and thus lessening social burdens. Public money is now largely used to prevent illness, but there is a growing

amount spent in curing—more in Europe than here. Lodge practice seemed to be the first step, and though it has not turned out as well as one would have wished, it seems to be a crude beginning of an instinctive effort at cooperative assistance. Society seems destined to take up the burden sooner or later, so that in time the vast majority of doctors, like the teachers, will be under public salary. In this, as in all other activities, the social organism is working largely for its own selfish interests, the individual's welfare being enhanced primarily for the benefit of society. Medical assistance in military life aims primarily to increase the efficiency of the army. In civil life too, public medical service, like education, is not an individual right, but a social necessity.

**The future average incomes of doctors** will be increased by the method of public employment, and probably at the same rate as those of teachers have been by socialization of the schools. Of course, the people most benefited in each case are the poor who could not otherwise get such good service for themselves or children. The rich will be able to hire private doctors as they now hire private teachers. There is no ground for the fear that remunerative private practice will ever disappear, particularly in the specialties. Anything exceptional always commands a price in proportion to the demand for it. But for the general practitioner there must be an improvement on present methods or the evolution would not be going on already. Like all other changes, this one will be too slow to injure anyone, so we need not worry our brains about possible hardships, nor can we hasten or retard such evolutions by individual efforts.

We will drift into it, like we drift to the millennium, unconsciously, painlessly and joyously. *The first step is to insist on payment for all who work in dispensaries, hospitals or any agency for curing the sick.* Only in time of possible disaster to all, can any organism sacrifice a few of its units to save itself. In war, the nation hurls its soldiers to certain death to this end, and in the war against bacterial invaders the body similarly hurls its white corpuscles to death, besides recruiting them enormously. But in ordinary times the welfare of each organization depends upon the welfare of its units, none of which are injured or sacrificed. Hence it is unnatural for doctors to neglect their own welfare to help others, and moreover except in epidemics they don't do it although there is a false glamor of altruism thrown over their labors. Unpaid work is never efficient; and that is the real canker in the present disgraceful condition of our dispensaries and hospitals. Men always try to do what they are paid to do, because they will lose their jobs for neglect. Let the reformers and reorganizers of public utilities, think a bit on this line. Doctors are trying to make an honest living for their wives and babies. Don't try to get their labor for nothing and thus drive those of weak moral fiber into dishonest ways. We cannot get something for nothing, and if we do, it generally isn't worth accepting. Pay your doctors, gentlemen, and get service that's worth paying for. It is a social need. Before we began preventing illness in 1866, New York's death rate was 33 per 1,000. Now it is 13.5 and the coincident poverty due to illness and death is proportionately reduced, though the aggregate is still appalling. If this is the result of paying sanitarians to prevent we can safely predict similar good from paying

doctors who are rendering public service in curing the unpreventable.

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**The load our students bear** is the subject of an important study by Dr. W. F. Waugh of Bennett Medical College, (*N. Y. Medical Record*, Nov. 28, 1914). The coroner of Philadelphia, after investigating the death of a student of the University of Pennsylvania, stated that three-fourths of the class were in the habit of taking stimulants because the work was too hard. Dr. Waugh found that the students of Bennett, many of whom must work to support themselves entirely or partly, complained of the strain and many resorted to strychnine, caffeine, alcohol and camphor. The showing, though not so bad as the Philadelphia estimate, was not good. Moreover some who worked for their living got through in better shape than those who devoted all their time to study. The personal equation is too large to form safe generalizations, and no note is taken of the amount of benefit received from the course of study. Some conscientious students will overdo the matter and the neglectful ones might get through in fine physical condition but ill-prepared for practice. Still, there is enough of truth in the coroner's estimate to create doubts as to whether we have not raised the requirements beyond the ability of the average student. To be sure in the old days of a four or six months course of winter lectures, some men burned the midnight oil to their own undoing, and we will have such cases no matter what the requirements, but there is justification for the belief that to obtain a diploma and license often requires an unsafe amount of application. We seem

to forget that the skull only holds a quart, and that if we want to pour in a pint of new things we must omit a pint of the old. Reading between the lines, we think we can see a growing opinion in the profession that we have allowed our college faculties to go too far, and that the time has now arrived to ease up a bit by culling out the non-essentials. In the old days, the student was really the pupil of a practitioner—his preceptor—and received practical training all that part of the year he was not attending lectures. The college began as an adjunct to office instruction. We cannot go back to these wasteful ways, but would it not be wise to devote more time to the clinical side and less to the laboratory, and incidentally make the examinations simpler? Much of the knowledge now acquired at so much cost of health, permits the student to pass his examinations, but it is never used afterwards. We do not pretend to say what should be omitted but we are safe in saying that some could be. At any rate the tendency is in the wholesome direction of easing up the strains. Dr. Waugh incidentally mentions a training school for nurses, in which the strenuous course ruins the health of quite a proportion of the pupils. He ought to give the name and place, so we can warn young women to avoid it, and then take steps to break it up, for a faculty so utterly ignorant of their hygienic duties, is unfit to teach anything. In every lay school each student is now being periodically examined to keep him in health, and yet some medical and nursing schools are ruining their students. Again the shoe-maker's children go barefoot.

Chicago, (*N. Y. Medical Record*, Nov. 21, 1914), and it seems to be a matter deserving of immediate investigation. Ever since this group of cases was differentiated from the other insanities, the disease has been a curious puzzle on account of the period of origin in apparently healthy young people, the occasional lucid intervals and probable cures. The normal periods show that the brain tissue was normal and able to functionate properly even when it was acting abnormally. The only rational explanation is that poisons of some sort were preventing normal activity—the biblical devils which we might exorcise by scientific therapy. Holmes mentions the analogy to the syphilitic psychoses and we might add the whole class of toxemic psychoses, such as those found in tuberculosis or indeed after any infection but particularly typhoid fever. It would not be an unpardonable etiologic sin to include all the post-operative and post-partum insanities in the toxemic class. Of course other psychiatrists have already studied every suggested cause of dementia praecox, but their conclusions have not yet reached the general profession, so that Holmes' suggestion is in the nature of news. He had previously suggested (*Cincinnati Lancet Clinic*, Jan. 17, 1914) that the poison or enzyme resulted from a perversion of the internal secretions of the sex glands, and perhaps also the other glands which take on activity at puberty. The remote cause of their dysfunction is probably some peripheral infection, since this period of life is one in which we seem to lose the bacterial immunity which is so effective both before and after. We have become accustomed to the idea that small infections at the orifices of the body, particularly in the mouth and nasal cavities, are responsible for an alarming amount of invalidism, but this new suggestion carries

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The toxic origin of dementia praecox  
is suggested by Doctor Bayard Holmes of

the matter much further than was imaginable two years ago. It seems so sensible and logical that it must be investigated at once. Each case must be carefully gone over for hidden infections to see if their cure will enable the defective glands to resume normal activity. If the cause is a mere defect of secretion as suggested by Lydston, perhaps organotherapy or transplantation may be curative. Holmes makes a plea to abandon the psychogenetic theory of its origin, and to consider it a preventable, curable disease due to physical causes. Remotely the prime cause is in some defect of hygiene or sanitation which has prevented normal development in childhood—perhaps the parents themselves are neurotic from improper living and their offspring are of poor stuff to begin with. It begins to look as though the crusade for better sanitation may even lessen our insanities. The outlook is at least encouraging.

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**The physical collapse of old army officers** is being reported so often from the war zone that there is arising considerable doubt as to the wisdom of using them. We have already shown that the art of war no longer depends upon the youthful mental quickness of commanders, for the modern staff composed of brilliant young men now does all the planning formerly the sole duty of the general. Consequently it may be better to have an elderly man in command to check the recklessness of youth. Yet the frequent mention of the collapse of old generals shows that in spite of all they still have duties too strenuous for their years. The senile heart has very little reserve power normally. It is not like the boy's heart which can be subjected to enormous strain in the occasional playful exertions

which seem to be common to all young mammals. The old heart works nearly to the limit of its powers and is sure to show signs of distress if extra work is demanded of it. We are not at all surprised to hear of the death by heart disease of these old men in the extra exertions of war—indeed the steps of our elevated roads and subways are said to claim a similar toll every year. The annual physical tests in our military forces were so disastrous that men over sixty are now excused. Why not retire them at sixty if they are to collapse in war? Lord Roberts succumbed to pneumonia in a few days. What is more interesting still are the hints of disabling nervous exhaustion among the old generals who are leaving the front for sanitariums. The nervous strains are too great for them as we have long ago found to be the case in civil employments. After sixty is the time to let up, though we have frequently remarked a man ought to work as long as he lives, for absolute retirement hastens death. Predictions are very uncertain in the wonderfully novel conditions of the modern warfare, but we would not be at all surprised to hear that some of the errors are being traced to the nervous exhaustion of staff officers as well as generals. The human nervous system cannot stand the strains to which these men are now being subjected, and they must of necessity form many bad judgments. It is at just this period of life, near sixty, that so many men in civil life make some stupendous blunder which wrecks them or their fortunes.

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**The relation of diet to cancer** was explained in an article by Dr. L. Duncan Bulkley (*N. Y. Med. Record*, Oct. 24, 1914) who had for years been convinced that the disease had a dietetic origin but who had

hesitated to announce his views for fear he might tempt sufferers to delay or refuse the necessary early operation. He does not look upon the cancer itself as the disease but merely the result of the underlying cause, which he thinks is a great surplus of nitrogen and possibly a deficiency of potassium as stated by Ross in 1912. Certainly the exclusion of the most nitrogenous foods from the diet and the administration of potassium, say the citrate, or both preferably, have been followed by very satisfactory results. Bulkley agrees with those who believe there has been a progressive increase of cancer and correlates it with an increasing consumption of meats, but this may prove the weak spot in the argument since we have been deluged with papers by economists and agriculturists complaining of the decreasing amount of meat in the dietaries of all civilized countries. He makes the point that in lower cultures where the people consume less meat, cancer is proportionately less. Here too the facts have been given other explanations. The dietetic theory does not disprove the hypothesis that cancer starts with little islets of embryonic or generative cells which have been included or enveloped by the growing ovum, but merely helps to explain why they take on riotous growth in some people and not in others. There is no explanation of the alleged fact that in one person, some of these cells may be affected and not others. The difficulties of the parasitic theory have led Bulkley to reject it, and perhaps the present trend of professional thought is against the idea of a living cause. Nevertheless there is no justification for an instant's pause in the laboratory search for a minute pathogenic organism, but the practicing portion of the profession must investigate and report their cases with a view to furnishing

facts from which some genius may discover the toxin, if the cause be one. The laboratories may not furnish the right man, who may be an obscure Jenner some where back in the woods. Practitioners of course are busy struggling for bread and butter and have little energy in their few moments of leisure. Still, John Hunter found time and we hope the immense amount of invaluable material in case books will not be buried with the observers. Civilization loses an appalling amount by the neglect to give the world these experiences.

**The decay of the theory of vitalism** is seen in little hints thrown out now and then by biologic investigators who do not yet dare to go to the extreme of asserting that there is no such fluid or essence as "life" in the usual meaning attached to that term. The latest definition is that "vitality, whatever else it may signify, means ability to resist unfavorable influences." Osterhout who makes this assertion (*Science*, Oct. 2, 1914) has been measuring the electrical resistance of certain plants in the Laboratory of Plant Physiology, Harvard University, and finds that the less the electrical resistance the sooner did death supervene. Moreover in no case did visible signs of death appear until after 24 hours after death and sometimes several days. If life is an entity which enters dead substances to vitalize them and departs when they die, it enters and departs slowly. This is a rather difficult idea to grasp as we always have thought that "life" departs quickly when it does go, the person being alive one instant and dead the next. If life is a mere ability to resist death, then we must get new definitions, for it will not do to define any-

thing in terms of its opposite. Curiously enough, while drifting away from the old idea of life as an entity different from matter, the biologic world shows no tendency whatever to drift back to the discarded materialism or mechanism of the last century, for it seems generally conceded that vital phenomena cannot be explained by the physical and chemical laws governing the reactions of dead substances.

**Living things are invariably groups of dissimilar units dependent on the group for existence.** By the cooperation of the units the group resists all influences tending to break up the group. If the cooperation between our body cells, for instance, ceases, the body dies but the cells live on until they die of starvation or chilling. If we can keep them fed and at a proper temperature they live a long time. We can utterly destroy certain lower organisms and yet reproduce new ones from each cell or at least from small groups of its cells. As far as we know nothing departed when we chopped up the organism. Its "life" must have consisted of the cooperation of its units. Death was the cessation of cooperation. Hence death may be a gradual process, and there are various degrees of "vitality." In this view, life must be defined as something more than "mechanism" or the physical laws of dead substances. Two substances in close contact act differently than when separated from each other, as by catalysis for instance. In the last analysis of course the laws are physical and not vital in the old mystical sense of the term. The fact which seems to be modifying all recent speculations is that vitality is the cooperation of groups of very unstable specialized units which can not exist unless helped by the group. This conception is of great im-

portance in medicine. The prolongation of the life and efficiency of the body depends upon keeping all its parts in perfect condition. If any one organ or tissue is damaged in any way, all the rest must suffer. The whole loses "vitality" or ability to resist lethal influences. Some parts are more necessary than others, of course, but all must be in good condition for perfect vitality. Life prolongation is dependent upon discovering parts which are breaking down and the treatment is to remove the causes. Long life is possible with a greatly reduced "vitality" if we reduce the unfavorable influences which are harmless to the body whose parts are in perfect adjustment and cooperation. The old term "vitality" is thus assuming an exact scientific meaning instead of the mysticism once attached to it. We are not only justified in using the term, now that it is no longer under a cloud, but we must use it and in every case we must carefully study the condition to which it refers—resistance due to cooperation of the tissues and organs. An athlete with a damaged heart has low vitality and needs careful regulation.

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**A new typhoid vaccine** was announced by Prof. F. P. Gay, University of California, in his Harvey Lecture at the New York Academy of Medicine, Oct. 10, 1914. (*N. Y. Medical Journal*, Oct. 24, 1914). There are about twenty others on the market, but all but a few are unsatisfactory because of the reactions and the uncertainty of the immunity, proper dosage and interval between doses. This new vaccine produces practically no reaction and confers a longer immunity. Gay also claims to have shown the occurrence of a specific hyperleucocy-

tosis in immune animals and its value, and to have devised a trustworthy test for immunity. He killed the "sensitized" bacilli with absolute alcohol, centrifuged them, then dried and ground the precipitate, rejecting the upper layer which contained the toxins but conferred no immunity. The best results are obtained from a polyvalent mixture of bacilli of different strains from the locality in which the vaccine is to be used. This great advance confirms our previously expressed opinion that the vaccine had been taken from the laboratory too soon. We have been going ahead blindly and so many inoculated persons have lost their lives from typhoid or a complication as to have weakened or destroyed the scientific value of the earlier reports. Indeed it was the need of more laboratory work which induced Gay to take up the investigation.

By a skin test like the von Pirquet for tuberculosis, but using an evaporated culture of typhoid bacilli grown on 5 per cent glycerin bouillon, he found that in a small proportion of cases the immunity by old methods lasts only a few months. At most, it probably lasts little more than two or three years, but is only five or six times the normal. The British found that very susceptible persons received no immunity at all by their method and that in the rest it generally faded in less than two years. Persons immunized by the old methods are no safer than the rest of us after a certain time and are saved from typhoid by hygiene and sanitation.

On account of the censorship we are still in the dark as to the use of vaccine in the war. The British are shipping immense amounts to the front but at the last reports its use was not compulsory. In France there is apparently a feverish search for a

vaccine which can be used on the firing line, a press dispatch hinting that the after effects of the present one have made its use impossible. It is quite likely that if a tubercular focus is activated by the vaccine under ordinary circumstances, recovery is generally prompt, but if the man is exposed to chilling and is constantly wet in the trenches he might develop consumption. We should realize that a reaction with fever shows a condition of disease which requires care and protection, not attainable on the firing line. Many have searched for a vaccine which can be taken by the stomach, but the rumor that one has been developed by M. Augustus Lumiere of photographic fame cannot be accepted without further scientific confirmation.

The reasons for the reduction of the tuberculosis death rate are now receiving careful study because everyone knows that the conduct of the future campaign against the disease depends upon our knowledge of its causes. Karl Pearson, one of the world's greatest statisticians, found that the reduction began long before we discovered the bacillus, before much was known as to methods of cure or prevention, and that the curve had not been much modified in Europe by the past crusade. He concluded that the phenomenon was the usual one by which a race becomes partially tolerant to any infection such as measles, by survival of the fittest, or those able to develop immunity, the susceptible being killed off. He has given great offence to the workers in this field and their indignation has been increased by Dr. Thomas J. Mayo of Philadelphia, who has asserted that as the yearly reduction of the death rate has been somewhat less in the last ten or fifteen years, the

crusade has actually increased the death rate over what it would have been had the old process continued. As we have previously explained, Dr. Mayo's conclusion can not be accepted because the yearly reductions must necessarily lessen as we approach the irreducible minimum. Indeed the rate in Buffalo, 1.2 per 1000, has not materially changed for about fifteen years, and the *Buffalo Medical Journal* suggests (Nov. 1914) that either it is the minimum under present economic conditions or that there is a factor, possibly climatic. Dr. S. Adolphus Knopf in defending the present crusade, (*N. Y. Med. Journal*, Nov. 7, 1914) makes the assertion that the modern methods of controlling the disease in New York City caused a reduction of 40 per cent between 1887 and 1902, a rather extreme view which would seem to be open to question since it assumes that the causes of the reduction prior to 1887 were no longer operative. Hoffman's statistics show that the rate has been irregularly declining since 1832, when it was 6.329. He remarks that "the problem of tuberculosis prevention, in other words, is intimately conditioned by the prevention of many other diseases and the elimination of many factors which lead to an impairment of physical vigor and diminished disease resistance." This is certainly a fair explanation of the fact that the great modern reduction began with the birth of practical sanitation in the early eighties. The curves for typhoid and tuberculosis for instance are more or less parallel. Since many cases of tuberculosis date from measles, whooping cough and other infections, it is evident that the more we prevent these diseases, the fewer will be the deaths from consumption. If the wonderful work of health departments is lessening this death rate, then in God's name let us pour more

money into their laps to multiply the good. The anti-tuberculosis workers have done such grand things, they need not be afraid to confess that they reach only a small percentage of consumptives, and therefore cannot possibly affect the death rate very much. We have 50,000 tuberculosis cases in New York City alone, but can give proper care to only a small percentage of them. If the "Home Hospital" described by Porter in our September number is to care for these cases better and cheaper than sanitaria, we beg our millionaires to contribute, for each dollar is a treasure laid up in Heaven.

#### The future crusade against tuberculosis

will probably be directed largely against the factors which reduce resistance. Nothing effective can be done in that direction until the profession comes to an approximate unanimity of opinion as to the full consequences of the discovery that practically all people in communities are tubercular from childhood, and that the perpetual auto-vaccination of the tiny lesions causes an immunity which resists massive infection from consumptives. Some are not yet convinced, but incline to the view that though practically every one does become actively tubercular some time in his life, the lesions completely heal, the bacilli die, the immunity fades, and the man is again so susceptible that he may perish from a massive dose. Some physicians seem to fear that if we acknowledge the harmlessness of consumptives to an adult, we thereby acknowledge that they are also harmless to babies who have not yet acquired immunity. No infectious disease can be communicated to immune, but no one dreams of asserting that smallpox is not contagious to the unvaccinated or typhoid not communicable to those who have not re-

cently had it. Indeed the dreadful results of contact between babies and consumptives would almost justify us in declaring tuberculosis a contagious disease as far as they are concerned. If the new facts as summarized by Hoffman are accepted we must teach the public that if a person develops consumption it is probably not a new infection but something has reduced the immunity developed by his own lesions, permitting them to spread, and that if this something is an improper mode of living, a timely restoration to normal living will cure the case. A husband may die of it but the wife remain healthy. If both become consumptive as in a small percentage of cases, it is probably due to the same environmental cause which has reduced immunity in each, for they were in all probability tubercular on marriage. Dr. Knopf asserts that this small percentage, which of course occurs in some thousands of recorded cases among the millions of married consumptives who have been studied, proves "without a shadow of a doubt" that the infection was transferred from one to the other. Dr. Knopf, however, can hardly expect this conclusion to be accepted until he furnishes proof that the husband or wife was free of tuberculosis at marriage, and was not infected from some other source. Such proof is necessary to substantiate this deduction. Some physicians who have studied the matter recently have asserted that a new infection of a city adult is exceedingly rare if it ever occurs. When several members of a group become consumptive, say of workmen in a factory, the fault is now generally laid to the environment—and the correctness of this conclusion becomes more firmly established as the evidence accumulates.

The coming year bids fair to be a very important one to AMERICAN MEDICINE. Plans in hand include much of interest for our readers, and as in the past honest, faithful service in behalf of the profession will be the keynote of our endeavors.

The year 1914 has undoubtedly been one of the most successful in the history of this journal. A larger amount of valuable material has been given to our readers than ever before, and our special Internal Secretions number (April) was received with such genuine approval from one end of the country to the other that we are seriously contemplating the organization of a regular department to be devoted exclusively to internal secretions, organotherapy and such closely allied subjects as vaccines, bacterins, etc., the whole to be placed under the direction of a recognized expert. A more detailed announcement in regard to this will shortly appear.

In our next number we shall give considerable space to an authoritative exposition of "twilight sleep." Papers by the men in this country who can speak with greatest authority will discuss all phases of this subject, and describe the technic that has been evolved as the most reliable and safe. Our May issue will take up the subject of "Rheumatism and the Rheumatic Diathesis." Already we have secured a gratifying number of articles by the foremost students of the pathologic problems of rheumatism, and we hope, through the publication of this issue to give to medical literature the most notable contribution on the subject that has appeared in recent years.

Our editorial and other departments will be conducted with the same earnest effort to present thought stimulating material. Independence and frankness, with careful avoidance of unkindness, courtesy or the spirit of faultfinding will continue to characterize our consideration of current topics. Of course, if we are attacked—but that's another matter entirely.

With hearts grateful for the kindnesses of the past and hopeful that we may be able to make AMERICAN MEDICINE more interesting and serviceable with each succeeding issue, we say good bye to 1914 and welcome the coming year.



## MEN AND THINGS



**The appalling incompetency of parents** has been forcibly emphasized by the reports of the physicians who have been examining school children in the last few years. In New York City it was reported some time ago, that half of the little ones were in urgent need of dental treatment, and over a fourth needed refraction, tonsils and adenoids removed or other work done on the air passages, while three percent were weak from malnutrition, not to mention the five or ten percent underfed and consequently undersized and anemic. These facts have been mentioned time and time again and convey nothing new. The startling revelation is the fact that nearly three-quarters of the children found so defective as to need treatment urgently were unable to get it either from private physicians or public institutions. This argues a state of parental ignorance and incompetency which is bound to eliminate these families as unfit for modern life. Our ancestors for a million years or so, knew little or nothing about raising children. The little ones were fed and guarded from mechanical harm but otherwise raised themselves. Those too weak to stand the adversities, simply died and that was the end of it, for there were no health authorities to worry over high death rates of babies. The mortality was dreadful, for in spite of an enormous birth rate the population increased very slowly. The result was the evolution, by survival of the fittest, of a strong type able to stand the environment. Is that what is going on in our cities? A constant slaughter of those unfit to be cooped-up and the evolution of a canary-bird humanity? We might teach some of these parents but many if not most of them will ignore our advice. Even if they understand our hygienic talk, they will be unable to get the fresh air and nutritious foods demanded. That is, they are not competent to obtain the essentials for raising babies and should not have had any. We

have said all that before, and we repeat it merely to warn our child-welfare philanthropists, that if these defective babies are to be given what they need, the public must give it in at least seventy percent of the cases. We feed thousands of them now and must feed more if they are to survive. As for surgical and medical care, publicly paid physicians must give it. The working men are already demanding such service as they confess that they themselves cannot afford to hire done. They confess incompetency like our ancestors, but claim the right to produce babies for other people to raise. What are we coming to?

**Norway's physicians are demanding more liberal divorce laws** according to recent dispatches. It seems that the legislature has been petitioned to make divorce cheaper and easier for the poor and that the movement has been started by the medical profession who have most intimately seen the wretchedness of mismatching with no hope of relief. This is very startling news, for though it has long been known that there is a pathological and often an anatomical reason for unhappy unions, the knowledge has generally been acquired in professional confidence and we have been loath to use it. It is high time to speak out now that the clergy have taken up their side of the matter so seriously. The divine injunction that, "whom God hath joined together let no man put asunder," is the great stumbling block to many devout people both lay and clerical. We hope that we are not impious in suggesting the need of proof that God has actually joined together some of the specimens we have met in professional life. It seems malignant to put on God's shoulders the blame for what looks like the work of the devil. That is, from the physicians' standpoint there are some unions so utterly unfit, that

"joining together" in the sense of the divine injunction is a physical impossibility. Equally impossible of union are the psychic misfits where antagonistic mental traits keep the two apart, in contrast to the normal union of two different minds which supplement each other.

**Perfect marriage perhaps never occurs** so that some friction is inevitable. Perhaps family jars are not so very bad. The making up is not without its compensating pleasures. When the antagonisms are permanent with no "making-ups" and life hardly worth the living, it seems hard to believe that Heaven decrees the misery to continue. We would ask our clergy whether the Divine injunction did not refer to the custom whereby a man could divorce his wife by merely announcing the fact and returning the dowry. Women, too, could divorce themselves by returning to their parents' homes. It must have been a great evil and by acting in haste many families must have been wrecked which would have been happy with a little forbearance induced by the knowledge that a proper divorce by society's decree was not so easy as the private divorce by tribal custom. On the other hand, the misery and secondary evils of incompatibility are so great, that if the medical profession were canvassed, it would probably largely vote to make divorce by social warrant easier to obtain, in all cases of abnormality. It is to a great extent a pathologic matter and pathologists, both mental and physical, should be consulted more than they have been. Clergy and physicians are probably more in accord on the whole subject than surface indications would lead one to believe. Perhaps some joint discussions would help to solve the problems as to the reasons why some unions fail which clerical conventions have recently tried to settle unaided by medical advice.

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**Old Men in War.**—Old men for counsel and young men for war, has been a sociological axiom so long that everyone is more or less surprised to learn that in the present war the old are apparently taking a larger part than ever before. It is an interesting medical study. In former times a war weeded out incompetent commanders sooner or later. In the end, the leaders were necessarily those who had succeeded. There

was no way in times of peace to find out who would be the best in war. Indeed such a great man is so out of place in peaceful pursuits that he is not only ignored but actually treated with contumely. The young man, Napoleon, was so little thought of in the army that he could not obtain employment. We drove Grant from our army and the British kept its greatest genius, Sir Charles Napier, awaiting orders for eleven years or more. Only the actual test of accomplishment in war, shows us who are the best. It so happened that in most cases the fittest to survive the ordeal were comparatively young, yet mature men with experience, training and good judgment. Grant has repeatedly stated that no general should be over fifty, as he found that beyond that age the mind was not quick enough and nimble enough to adapt itself to the new conditions daily arising. The elderly were always trying to adapt old ways of doing things to the new conditions, but the young were inventing new ways. As a mere boy, Napoleon bowled over aged generals who childishly complained that he was not campaigning by the established rules and as they could not tell where he would be or what he would do, they could not make proper plans. Napoleon himself became prematurely senile and could not adjust his old ways to the new conditions of the alliance against him.

All this seems changed now, and we find that all the commanders in the war are over fifty, many over sixty and some close to seventy or over. To be sure we hear that many elderly commanders have been relieved of their duties as failures, some being summarily dismissed and others committing suicide as in ancient times, but we are yet to hear of the rise of the young. Caesar was in his early twenties when he showed his abilities, Alexander and Richard II were only 32 when they died, and so we might go down the list of the world's greatest generals. Von Moltke was the first of the moderns to hold on until old age. The reason for the change seems to be the modern system of concentrating the general's duties in a general staff composed of comparatively young men who do all the planning which was formerly done by the general in command alone. Modern armies are too vast to be directed by one finite mind. Ancient armies were so small that one man could direct them, indeed the same number

of men are still directed by a single commander without much of a staff. But the plans of campaign are a composite result of dozens or scores or even hundreds of nameless experts whose personality is submerged in the organization. Some of them are brilliant in the extreme, and in ancient times would have been famous. Possibly the same percentage are great strategists as in ancient times, perhaps they are greater than Hannibal but their very numbers now prevent individuals from rising. They do better in the "team-work" of a great organization. The military machine has become a great impersonal monster whose brains are in the skulls of young men who learn the facts, then think, plan and issue orders to the elderly commanders, who in their turn are surrounded by a great staff of young men to attend to the details. Successful generals are now men who have the genius to get the right kind of men to do the work for them. They are like the modern captains of industry who are said to be the laziest and most idle men in a corporation, but who are in reality always thinking out plans and constantly searching for the right men to do the execution. Old men who have learned their own limitations can generally do this far better than the young who are overconfident of their own abilities.

As a matter of evolution then, the old are taking more active part in war than ever before. Human psychology has not changed a particle, but the modern army uses all men and all ages to their maximum and in better cooperation. There are now hundreds of young Caesars and Alexanders and Napoléons, doing as good work as these great strategists but doing it better with fewer mistakes as parts of an organization. If the scientific rules of war are carried out, a Napoleonic disaster is impossible. The young minds doing all this work will never be known, but the general whose young staff carries out the details gets the credit. The facts are not so paradoxical after all. War is still the province of young men.

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**George Livingston Peabody.**—Dr. Geo. L. Peabody died suddenly of heart disease on Oct. 30, 1914, at his home in Newport, R. I., in his sixty-fifth year. He had occupied a prominent place in New York City medical circles and was quite forceful now

and then in the expression of his views—a very desirable trait in a teacher who knows himself in the right. He graduated in Arts and Medicine from Columbia University and took up post graduate work in Europe, becoming Lecturer in Medicine at Columbia in 1884, and Professor of Materia Medica and Therapeutics from 1887 until 1903, serving also as trustee from 1884 to 1890. He also served on the staffs of Roosevelt, Bellevue, New York and St. Luke's hospitals.

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**Dr. James Gregory Mumford.**—Medical literature lost a shining light by the death of Dr. James Gregory Mumford, October 18, 1914, at the age of 52. His productiveness should have lasted much longer and would have been mellowed by richer experience. He was a Harvard product but a native of Rochester, New York. His professional career was spent in Boston, where he held numerous appointments in hospitals and dispensaries. His literary work was largely historical though the professional papers were quite numerous, mostly on surgical topics. He wrote the introductory article on the History of Surgery for Keen's System, and edited the history of Harvard Medical School. It seems strange that one who had written so often and so well should not have been more widely known and read. His death notice was the first knowledge many had of his work. In the time of Holmes he might have had a larger audience, but so many write nowadays, that they drown out individual reputations.

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**August Weismann.**—August Weismann, who died in Freiburg, Germany, November 6, 1914, in his eighty-first year, was one of few great biologists who have profoundly modified modern theories of heredity and development. He graduated in medicine at Goettingen but later studied zoology at Giessen and then became Professor of Zoology at Freiburg in 1867, a position he held until his death. His early work was mostly histological or in reference to individual species, and it was not until middle life that he attracted the attention of the biological world by his remarkable ideas. His greatest contribution, and the most enduring, was the conception of the continuity of the germ-plasm. Briefly and

crudely stated, it affirms that the soma or body is merely the scheme for protecting and nourishing the germ-plasm which flows on in a continuous stream generation after generation. It is entirely distinct and—is not affected by any modifications of the body which is composed by specialized descendants of the germ cell itself. Of course, if the body becomes sick, the poisons it develops may modify the ovules and spermatozoids, and the moths might still further poison the ovum during gestation and later during lactation, causing the new being to develop differently from either parent. Weismann also thought that variations in nutrition modified the germ cells. Such a change in the germ-plasm might be a permanency and a new variety or species thus occur, but it is a result of modification due to the environment and is not derived from heredity in any sense of the word. The ordinary changes in a healthy body, such as mutilations cannot possibly be transmitted to the offspring.

This great conception seems to be a permanent fixture of modern biology. To be sure, there has been a revival of the old idea that somatic environmental modifications are sometimes transmitted. It is undoubtedly true of unicellular organisms which reproduce by simply splitting apart, and though our botanists assert that it is also true of higher plants, the zoologists are very largely followers of Weismann. Variations were explained by Weismann as mostly due to the sexual union of the male and female cells, the mixture being different from either. This idea has been more or less shattered by the discoveries of Mendel, by which it is shown that characters do not blend but are transmitted as unchangeable units, sometimes being dominant and sometimes recessive or latent. Similarly almost all of Weismann's detailed ideas as to how characters are transmitted are now largely forgotten and even the terms he invented are rarely if ever used. The general trend of thought is in the direction of considering every departure from parental type as due to some factor in the environment which has been able to change the germ-plasm into a new form. This, together with Weismann's proof that a change in the body has no way of influencing the germ-plasm, has profoundly changed all our former medical ideas on the subject of the inheritance of disease or deformity. No greater good

to humanity can be imagined than this proof that a baby is generally born in a healthy condition, and will develop normally into its ancestral type if we only let it alone and feed it right. Humanity's ills are post-natal acquirements and are not generally transmissible. Abnormal people may have and generally do have normal babies, unless the abnormality has profoundly changed. The germ cells as in the case of deaf-mutism, albinism, feeble mindedness and other defects which we know are due to the inability of the germ cells to develop normally—and of course the germ cells of the next generation are merely pieces of those of the first so both must develop alike. Some European eugenists take too extreme a view of the matter when they consider all defects as transmissible.

Another corollary from Weismann's theory is the conclusion that criminality itself is of environmental origin—not in the old sense that the young offender is a perfectly normal person taught to do wrong, but in the newer conception that through bad hygiene and bad sanitation he has failed to develop properly. By Binet's test most young criminals are found to be in a condition of arrested mental development, and might have gone wrong no matter where they were born—in fact most of them come from respectable families—but it is evident that their chances of becoming criminals are vastly increased by life in the slums. On the other hand a normal boy generally turns out all right in spite of these suggestions. Heredity keeps us straight, and the ones who go wrong are those who have previously been weakened or checked in growth by the environment. It is the duty of the medical profession to find out why so many children of good parentage are physically damaged and drift into prison, for it is a medical problem. The conditions are preventable and should be prevented. Let us get at it.

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**Charles Sedgwick Minot.**—Charles Sedgwick Minot, the anatomist of Harvard University Medical School, died on Nov. 19 at his home in Milton near Boston aged 62 years. His work on biological subjects, chiefly embryology, had brought to him world-wide recognition as a scholar and worker. Universities apparently vied with each other in doing him honor. Much of his success was due to his thorough prepara-

tion for his life work. After receiving his degree of Ph. B. at the Massachusetts Institute of Technology in 1872 he spent three years in the Universities of Paris, Wurzburg and Leipzig, and he later earned the degree of Sc. D. at Harvard in 1878. He has been lecturer or professor since 1880. Few men have such opportunities and fewer still are able to take full advantage of them even when they do have them. Men like Sir Oliver Lodge become great in spite of lack of these opportunities, but there is no question that we would have more and better thinkers if more could get early training like Minot. His works include text books on human and vertebrate embryology and a remarkable essay on Age, Growth and Death published in 1908. It is pertinent to remark that Minot's success may also be partly due to specialization for he was not handicapped by filling his mind with a mass of medical facts of use to practitioners only. Most colleges have limited the choice of professor of anatomy to men holding a medical degree, preferably a practicing surgeon, and quite naturally the advances in the science have been made by those who devoted their whole time to it. The matter of whole time professors who are not practitioners is bound to be an important item in future medical education. Professor Minot was an ex-president of the American Association for the Advancement of Knowledge and an active or corresponding member of many scientific associations both here and in Europe. Harvard University has suffered a great loss, and so has science and especially medicine.

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**Happy New Year.** "Peace on Earth Good Will to Men" has been a prayer for two thousand years—because there was no peace nor good will. Man has always been struggling for existence against competitors, and if a truce was ever declared it only gave a breathing time to prepare for a new war. The present horrors in Europe are merely repeating what has occurred over and over again. What better New Year's wish can we make than that the truce may come quickly, and that in the new breathing spell, we will find out the cause for these periodical organized murders and remove it. The material damage of war is soon repaired. Economists tell us that even in peace the wealth of the world is renewed every fifty

years. A few things last longer but most decay sooner. The birth rate always rises after a war and soon repairs the gaps in the population. But why destroy at all?

War of course insures survival to tribes or nations which would have been swamped by the better arts of peaceful neighbors. The whole race has thus inherited an instinct to resort to force to settle conflicting interests. Even the decrees of arbitration must be enforced by arms. In spite of all this, the opinion grows that no matter what benefits may have been once conferred on mankind or parts of it by war, the time has now arrived when the evil far outweighs the good. The extermination of competing tribes or nations, the original purpose of war, is now impossible. A war merely changes political boundaries, and the border inhabitants get new tax gatherers. Intrusive conquest has never left a trace in the long run, if the climatic change has been great. People can only overrun near neighbors and if they get settled there, as in England for instance, they can now prevent later invasions from the fatherland. Why then go to the trouble of destroying if it is only to rebuild?

There is therefore a movement to investigate the underlying biologic causes of war to find out why there are conflicting interests between nations. Should we succeed, the coming year will be the happiest of all time, for when the causes of war are known, it is but a step to their removal. Now we are helpless to prevent and wars are inevitable. It is essentially a medical problem and we hope the profession will take more interest in it than in the past. If populations increase so fast that they cannot be fed without taking from neighbors, why bring forth so many?

The past year, in spite of its horrors, has not dealt very badly with us in the New World. It has not been as good as it might have been, but for what it has given us let us be grateful. Most of us are still alive, and what is better still, have the strength and desire to help those who have not been as lucky as we have been. Everyone has something for which to be thankful, yet not for a generation have we had more cause to wish for a Happy New Year. Never before have we more desired the benediction for "the peace which passeth understanding" to be with us and abide with us.



## EXPERIMENTS WITH EMULSIONS OF ORGANS TAKEN FROM THE DEAD HUMAN BODY AND SEX-GLANDS OF THE LOWER ANIMALS.

BY

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In connection with my recently reported series of experiments in the implantation of sex-glands taken from dead human bodies,<sup>1</sup>. I made brief reference to certain experiments I had been making with emulsions of tissues from dead human donors. The purpose of present paper is to record these experiments in more comprehensive form.

The idea of the tissue emulsion experiments was based upon the following, viz.:

1. (a) Dr. Leo Loeb's experiments showing the feasibility of cultivating living tissue cells both *in vivo* and *in vitro*.<sup>2</sup>

(b) The fact that cell death is not synchronous with somatic death.

<sup>1</sup> Implantation of the Generative Glands and Its Therapeutic Possibilities, *N. Y. Med. Journ.*, Oct. 17, 24, 31 and Nov. 7, 1914.

<sup>2</sup> Johns Hopkins Hospital Bulletin, 1898, Proceedings of the Society of Experimental Biology and Medicine, VIII, 1911, and Anatomical Record, VIII, 1912.

Loeb's experimental results were the pioneer indices of everything that since has been done in tissue transplantation. The distinguished scientist has not received the credit due him at the hands of certain investigators, with whom scientific enthusiasm is submerged in the desire for personal prestige.

2. The belief that, even granting the efficacy of tissue extracts, fresh tissue emulsion, if it be practicable to employ it, should be far more reliable.

3. The results of my own experiments in implantation upon the living of organs derived from somatically dead donors.

4. The belief that tissues and organs taken from healthy dead human bodies are not only safe for use upon the living, but far more logical in therapy than are preparations of any kind made from the lower animals.

5. Disbelief in the alleged dangers of anaphylaxis—by virtue of the injurious action of the proteid—in using organic tissues or juices from alien sources, dead or living.

6. The suspicion that every non-glandular, as well as glandular tissue, forms a nutritive stimulant and defensive metabolic product of a degree of specialization and potency directly proportionate to the degree of specialization of the organ tissue itself. Such a metabolic product naturally might be expected to have a special action upon the nutrition in general, and a special action upon the organ which produces it, or upon the same organ in other subjects. The idea of a highly specialized metabolic product is in a measure substantiated by Abderhalden's theory of the specially differentiated albumen molecule as a basis for organ function.

In a recent interesting article on the mechanism of immunization by Williams and

Beveridge appears the following: "The mechanism which gives the human organism partial or complete immunity against bacterial disease, comprises what may be called the cytogenic system—including lymphatics, bone marrow and spleen—with its daughter cells, the white and red blood corpuscles, as its active agents, and with the liver as the excretory organ of the waste products incidental to the immunizing process.

"This theory assumes that the entire cellular system of the organism—viscera, muscles, brain—may be considered as a secondary apparatus, standing, as it were, in the background, ready to supplement the work of the chief immunizing agents. So general an implication as the latter may seem to savor of the nature of a truism; but it will appear that the theory ascribes a specific and definite part in the immunizing process to the body-cells, in general and in particular, attempting to trace the precise rationale of their activity. Equally specific is the interpretation of the activities of the leucocytes and the red blood corpuscles, which are deposited as the chief and controlling mechanism in the process of immunization."<sup>1</sup>

The foregoing theory has a direct bearing upon the possible therapeutic uses of organ emulsions.

All experimental emulsions were kept refrigerated, but not frozen. As the emulsions were not only refrigerated, but prepared with tri-kresol, the possible danger of syphilis was not seriously considered. Experiments with all emulsions were first made upon the guinea-pig.

The first experiment was with kidney tissue removed from the body of a man dead twelve hours from contact with a live

wire, and from which I had an emulsion prepared with isotonic salt solution, and as concentrated as was compatible with injection via a No. 20 needle. The entire tissue was used. Lest the criticism be made that the tissue was of doubtful vitality because of death by the electrical current, I would refer the reader to my gland implantation experiments, in which testes removed from bodies dead from electricity were successfully used. In one instance an entire testicle was successfully used from the same body from which the kidney under consideration was removed. In another case a portion of testes from the same donor was used.

#### EXPERIMENTAL SERIES A.

Human kidney emulsion. 12 grams of kidney tissue in 4 cc. of isotonic salt solution. Tri-kresol, .2%, added as a preservative. Injection made intraperitoneally. Dosage 1 cc.

Preliminary cultures made of emulsions—no growth.

1. First pig—1 cc. injected, showed some orchitis, disappearing second day. No other reaction.

2. Second pig—1 cc. injected every other day for ten days. No reaction of any kind. Pig in good condition. Ate well. After an interval of three days pig was given another injection. No reaction. Another injection given again in 5 days. No reaction. Another injection given again in 10 days. No reaction.

Pigs soon after were used as complement in Wassermann tests. They proved exceptionally good.

The "orchitis" in the first pig doubtless was due to traumatic irritation of the intra-pelvic portion of the spermatic cord, and probably was associated with a more or less marked inflammation of the peritoneum covering the cord, merely as a result of traumatic "insult."

Following the foregoing experiments I injected subcutaneously upon my own person, in the anterior aspect of the thigh, for one week, a daily dose of 3 cc. of the kidney emulsion. No harmful effects resulting, I submitted the remaining portion of the emulsion to my friend Dr. J. L. Smith, who, administered it to a case of chronic nephritis

<sup>1</sup>The Mechanism of Immunization, Drs. Henry Smith Williams and James Wallace Beveridge, AMERICAN MEDICINE, Oct., 1914.

in its last stages. The dosage was the same as employed upon myself. Four daily injections were given. No result of any kind was noted, the remedy, if ineffective, apparently being harmless, which observation, so far as it goes, is at least encouraging to future experimentation.

#### EXPERIMENTAL SERIES B.

**Human brain and medulla emulsion.** Isotonic salt solution. .2% tri-kresol.

The history of this particular brain is most interesting. It was removed from the body of an apparently healthy man of thirty, dead about eleven hours of an accidental fall. The brain was removed with the ordinary post-mortem instruments, with no anti-septic precautions, by a medical friend who was not aware of the purpose for which I had requested him to procure the organ. It was placed in a dirty, rusty pan, covered with a newspaper and allowed to remain in an undertaker's morgue awaiting my disposal. As it was a hot July day, the prospects of satisfactorily using the brain for emulsion experiments seemed, on my arrival four hours later, a trifle unpromising. I took the organ to my office, however, washed it thoroughly in cold water, and placed it in a pitcher of solution of chinosol, 1-2000. Four hours later it was sent to the laboratory, removed from the chinosol solution and placed in normal salt solution. As will be noted, the emulsions made from this brain were sterile, thanks, I believe, to the chinosol, which is not only an excellent anti-septic but seemingly has the merit of preserving tissue without destroying it. The test of the drug certainly was a severe one.<sup>1</sup>

- A. Emulsion of medulla.  
Cultures made—no growth.  
Aug. 4th.—Guinea-pig injected 2 cc.—no reaction.  
Aug. 5th.—Guinea-pig injected 2 cc.—no reaction.

Aug. 6th.—Guinea-pig injected 2 cc.—no reaction.

- B. Emulsion of cerebellum.  
Cultures made—no growth.  
Aug. 4th.—Pig injected 2 cc.—no reaction.  
Aug. 5th.—Pig injected 2 cc.—no reaction.  
Aug. 6th.—Pig injected 2 cc.—no reaction.

- C. Emulsion of cerebrum.  
Cultures made—no growth.  
Aug. 4th.—Pig injected 2 cc.—no reaction.  
Aug. 5th.—Pig injected 2 cc.—no reaction.  
Aug. 6th.—Pig injected 2 cc.—no reaction.

At the conclusion of the laboratory experimentation, I injected in my own person daily for ten days, in the anterior aspect of the thighs, doses varying from 3 to 6 cc., using the cerebral emulsion. No effects were noted, save a little soreness and swelling for a day or two with a little redness of the skin in several of the injected areas. Simultaneously with the auto-experimentation, I administered intramuscularly the cerebral emulsion to a medical friend of seventy years of age who was suffering with profound and obstinate "neurasthenia." Incomplete observations on the blood, blood-pressure and urine were made in this case. No physiologic results were noted, but there was a marked change for the better in the subject's physical condition, which possibly would have been greater had there not existed unavoidable causes for mental worry. As to whether or not the change for the better was due to the treatment, this, of course, is an open question.

In a case of a healthy subject to whom I daily administered 6 cc. doses of cerebellar emulsion intramuscularly in the gluteal region—the point of administration in all the cases except myself—there were no results save that the patient stated that an erection and nocturnal emission followed the first dose; these phenomena not having previously occurred for the preceding ten months. In a number of other practically healthy subjects similarly treated, nothing of the kind was noted.

In all, I administered the brain and medullary emulsion to ten subjects. In none

<sup>1</sup> Note in this connection Seiffert and Hüne, Gewinnung Keinfreier Lymphedurch Zusatz von Chinosol. Cent. f. Bakt., 1913, vol. 71, p. 86.

were there any adverse results. Several of the subjects expressed themselves as invigorated and as having an increase of appetite. There was no psychic element in the results other than that attendant upon any kind of treatment, as the precise nature of the "medicine" was not confided in any instance. In several cases, following the full dose of 6 cc. there was some muscle soreness with a slight rise of temperature—.5 to 1°. As a rule, no special soreness at the site of injection was complained of.

At my request Dr. Geo. Leininger, superintendent of the Chicago State Hospital, instituted a series of observations of the effect of the emulsions. His results are set forth in the following letter:

"Dunning, Ill., Oct. 26, 1914.

"Dr. G. Frank Lydston,  
32 N. State St.,  
Chicago, Ill.

Dear Doctor:—

I am sending you a short summary of our results with patients who were given injections of cerebral and cerebellar emulsions. Eight patients in all were treated. Six of these were diagnosed as dementia praecox, including the catatonic, hebephrenic and paranoid types. One epileptic and one paretic also were given the injections. In only one of these cases, the epileptic, was there an increase of about 4,000 leucocytes. Only one patient showed temperature changes and this was a case of paresis, temperature going up as high as 102, rectal. This was after the third injection that the patient received, other times 100 and 101.

Two of these patients showed some improvement, although the nature of their illness makes it very unsatisfactory as one was a catatonic who was in a stuporous condition and the other, a paranoid dementia praecox case, who had not been eating well but who started to eat and since that time has been in a very good condition. The initial dose in each case was 4 to 4½ cc. These were increased in some of the cases up to 6, 7 and 8 cc. However, as the amount of the material was small, it was not possible to give larger doses. All received at least 8 doses and from that amount up to as many as 20. Summarizing will say that the only temperature rise was in the paretic, a condition which is not uncommon among these patients and probably was not due to the injections. One cannot account for the increase of the leucocyte count, other than it was due to the injection.

The improvement in the two cases noted, may or may not have been due to treatment but one would hesitate to say that it was due to the treatment, because it was naturally supposed that these two cases would improve.

We wish to thank you very much for the material which you gave us and we are very glad that we were given the opportunity to use this and certainly appreciate your interest in this line of work.

Yours respectfully,  
(Signed) GEO. LEININGER, M. D.,  
Superintendent."

Comment upon the foregoing, save to agree that an increased leucocytosis naturally should follow full doses of the emulsion, would be superfluous. I wish to state, however, in passing, that I am under the deepest obligations to Dr. Leininger for many courtesies and for co-operating with me, under very adverse conditions, and at great inconvenience to himself in all my experimental work. In this work of co-operation, Dr. Leininger's efforts have been ably supported by a staff of hospital assistants which is second to none in this country in earnestness of purpose and enthusiasm.

#### EXPERIMENTAL SERIES C.

Human spleen emulsion. Isotonic salt solution .2%. Tri-kresol.

Cultures made—no growth.

(1) Oct. 13th.—1 cc. injected into peritoneal cavity of pig—no reaction.

Oct. 14th.—1 cc. injected into peritoneal cavity of pig—no reaction.

Oct. 15th.—1 cc. injected into peritoneal cavity of pig—no reaction.

Oct. 16th.—1 cc. injected into peritoneal cavity of pig—no reaction.

Pig in good condition, eats well.

Pig killed and successfully used for Wassermann complement.

(2) Guinea-pig injected, inner aspect of thigh, with 1 cc. human spleen emulsion daily for five days. A few small nodules size of sage grains formed at site of injection under skin. Pig was killed and successfully used for Wassermann complement. Autopsy showed slight hyperemia of lower lobes of lungs, anemia of the liver and spleen and injection of cortex of kidneys. Otherwise normal.

Injections of from 3 to 6 cc. were given daily for a week to three healthy human subjects. The only result noted was an apparent loosening of the bowels, for several days in one case. Three subsequent cases were more suggestive.

1. A man forty years of age, suffering from constipation, but otherwise in prac-

tically perfect health, stated that his bowels moved only once in two or three days, and then only with cathartics. After two injections of 6 cc. of the splenic emulsion on two successive days, the bowels moved normally and freely every day for one week. Constipation recurring, a second dose was given, with satisfactory results lasting six days, when a third dose was found necessary. Since the third dose, a period of three weeks, the bowel movements have been daily and normal.

2. A man twenty-five years of age had suffered for some months from constipation. A single dose of 6 cc. of splenic emulsion resulted in daily movements of the bowels for six days. The bowels again became sluggish and 4 cc. of liver emulsion were administered, apparently with excellent results for twelve days, when the patient ceased to report.

3. A man twenty-eight years of age under treatment for prostatitis had been constipated for several weeks. A single dose of 6 cc. of splenic emulsion was followed by daily movements for one week.

#### EXPERIMENTAL SERIES D.

Human pancreas emulsion. Isotonic salt solution, .2% tri-kresol. Guinea-pig injected.

Oct. 13th.—1 cc. emulsion injected into peritoneal cavity—no reaction.

Oct. 14th.—1 cc. emulsion injected into peritoneal cavity—pig complained, sat in corner moaning.

Oct. 15th.—1 cc. emulsion injected into peritoneal cavity—complained.

Oct. 16th.—1 cc. emulsion injected into peritoneal cavity—complained.

Oct. 19th.—Pig evidently dying and was chloroformed.

Pig was satisfactorily used for Wassermann complement. Autopsic findings:

Generalized hemorrhage and fibrinous peritonitis, hyperemia of lower lobes of lungs, hyperemia of cortex of kidneys, thrombus on mitral valves.

The peritonitis in this pig was so obviously due to serious traumatic injury at the time of injection of the emulsion into the peritoneal cavity, that I did not regard it as indicating any danger from the proper use

of the emulsion in the human subject, or even in the guinea-pig. Another pig was subjected to a similar series of injections in the inner aspect of the thighs, with no untoward result. The animal was killed and successfully used for Wassermann complement. Autopsy showed nothing abnormal save edema of the left thigh and slight diffuse hemorrhagic infiltration of the right thigh from the last injection given. After administering to myself three daily doses of 3, 4 and 6 cc. respectively, I gave a series of seven daily gluteal injections of 6 cc. to a woman of sixty years of age, who was under treatment for syphilis of long standing. A blood count was made in this case, and an increase of leucocytes from 6,000 to 8,000 was noted on the third day. The leucocytosis gradually disappeared after the fifth injection. No other effect was noted.

#### EXPERIMENTAL SERIES E.

Human liver emulsion. Isotonic salt solution, .2% tri-kresol. Cultures made—no growth. Guinea-pig injected.

Oct. 13th.—1 cc. emulsion injected into peritoneal cavity—no reaction.

Oct. 14th.—1 cc. emulsion injected into peritoneal cavity—no reaction.

Oct. 15th.—1 cc. emulsion injected into peritoneal cavity—no reaction.

Oct. 16th.—1 cc. emulsion injected into peritoneal cavity—no reaction.

Pig in good condition, eats well.

Pig killed and used satisfactorily for Wassermann complement. Area of localized peritonitis at site of injection, diameter 2 cm. Old infarcts (2) in liver and (2) in lungs. Hyperemia of lower lobes of lungs. Hyperemia of vessels of heart.

Intestinal peritoneum normal; no puncture of intestines.

The liver emulsion was tested on four human subjects, without untoward results. No tests of the action of any of the human emulsions in disease were made, excepting in the cases of constipation already recorded.

Desiring to make a more severe test of the safety of tissue emulsions I decided to employ alien organs and procured a quantity of testes of young rams, *Digitized by Google*

## EXPERIMENTAL SERIES F.

Ram's testicle emulsion. .2% tri-kresol used as preservative. Cultures made—no growth. Guinea-pig injected.

Oct. 12th.—1 cc. emulsion injected into peritoneal cavity—no reaction.

Oct. 13th.—1 cc. emulsion injected into peritoneal cavity—no reaction.

Oct. 14th.—1 cc. emulsion injected into peritoneal cavity—no reaction.

Oct. 15th.—1 cc. emulsion injected into peritoneal cavity—no reaction.

Oct. 16th.—1 cc. emulsion injected into peritoneal cavity—no reaction.

Pig in good condition, eats well.

Used for Wassermann complement satisfactorily. Autopsy.

Old infarcts of liver, old endocarditis, otherwise normal.

Following the guinea-pig experiment, I administered to myself in the anterior aspect of the thighs, six doses of from 3 to 6 cc. of the testicle emulsion. The only untoward effect was a slight swelling and redness of the skin following two of the injections of a full dose of the emulsion, and slight lameness—traumatic—for a day or two. There was no rise of temperature.

I subsequently employed the testicle emulsion quite freely in my clinical work, administering in all probably 100 doses, varying from 1 to 6 cc. to ten subjects. The cases were all pseudo-impotents and sexual neurasthenics, with the exception of one case, that of an elderly woman afflicted with senile pruritus.

From the apparent results of the treatment I concluded that the action of the emulsion was distinctly tonic. The male patients all stated that their condition had improved. To outward appearances the subjects in the main appeared better, color especially being improved. Several of the patients stated that they had a greatly increased appetite.

As to the possible psychic result, it could have been incidental only to the novelty of the treatment. None of the patients knew what he was taking. The case of senile pruritis was not improved, nor was any effect whatever noticeable. Some of the emulsions

used in my experiments were more than eight weeks old when used. The spleen, liver and pancreas used in preparing the emulsions were taken from a male subject of 25 years of age, dead twelve hours of cocaine poisoning. No effect of such amount of the drug as may have been contained in the tissue was noted. That narcotic poisoning does not destroy organ-cell vitality is proven by the fact that I successfully implanted a testis from the same subject. The testis has been in situ for twelve weeks and apparently is thriving.

The addition of tri-kresol to the emulsions may or may not have modified the results. With improved technique of preparation and use, it would be better to omit the preservative. If, however, it should be proved that the preservative is not detrimental, it would be better to employ it as a partial insurance against carelessness in manufacture, manipulation and administration.

## CONCLUSIONS.

1. Properly prepared aseptic emulsions of organs from somatically dead human donors may be safely used for experimental-therapeutic purposes.

2. By virtue of their living cell content, emulsions or organs prepared without chemical preservatives, possibly may be a substitute for organ implantation in hormone therapy.

3. While emulsions free from preservative of any kind and kept properly refrigerated probably are more efficacious because of preservation of cell vitality in the organ material, therapeutic possibilities must be conceded to emulsions prepared with tri-kresol, and perhaps with other antiseptics.

4. Anaphylaxis, or other dangers, from the protein content of the emulsions is not to be apprehended—at least from reasonable doses.

5. Organs from alien sources, i. e. from the lower animals, may safely be employed in emulsions used upon the human subject.

6. It may prove practicable in emergencies to furnish nourishment to the human

body by the use of organ or other tissue emulsions from either the human or the lower animal subject.

7. Splenic emulsion, at least, and probably testicular emulsion, apparently is of therapeutic value. I should expect great results from thyroid emulsion.

8. Emulsions from organs from dead immunized human subjects may be of service in the "resistance-therapy" of certain infectious diseases.

9. Even admitting the superiority of "extracts" in the treatment of disease, I believe that my emulsion work has opened up a promising field for the production of extracts from human organs, which logically should prove far more potent and efficient than similar extracts from corresponding organs of the lower animals.

10. Further experimentation by clinicians is desirable as tending to enlarge the scope of organotherapy.

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## THE NEUROSES OF ALCOHOLICS AND INEBRIATES.

BY

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A few years ago, an attempt to present the scientific study of the degenerations common to alcoholics and inebrates, would have been regarded as empirical. Forty years ago, the first papers I read on The Disease of Inebriety, before medical societies, were tolerated, but met with a silent contempt and skepticism. Most of the profession from the leaders down, considered all writings of this character extravagant, foolish and unscientific.

No one seemed to regard spirit and drug addictions as neuroses or diseases, but on the contrary, as mere moral lapses, and weaknesses of mind and body, which required clerical and other than medical aid. The fact that from Hippocrates down, many

eminent men had written and described the drink neuroses as a disease, and urged its study and physical treatment, was practically unknown.

Scientific studies and clinical observations brought striking confirmation of the disease theory, and indicated that the phenomena of the drink and drug neuroses could not be explained from any other point of view.

Modern laboratory researches of the effects of alcohol on the cell and tissue, brought out a wealth of evidence, concerning the degenerations following the erosive action of this drug, and yet physicians showed timidity and hesitation in the presentation of such facts, because of their conflict with the theories and prejudices of the past.

Why the disease of inebriety has not received the same consideration and study as epidemics and other widespread maladies and why we should not regard it with the same scientific scrutiny as any other phenomena of disease, is inexplicable.

The only possible reason is that alcohol as a beverage and as a drug is still invested with traditions, superstitions and theories, also with commercial interests, that center about its manufacture and sale. These are practically prohibitive to critical inquiry and revolutionary studies.

The object of this paper is to group and compare many of the general facts that are now recognized as outlines of a new territory of medical research and practice.

The alcoholic and the inebrate are two distinct types of neurotics. The inebrate is a psychoneurotic who drinks at intervals and has distinct free periods of total abstinence, during which he appears healthy and normal, and acts sanely. The return of the drink paroxysm is marked by complex manias, delirium, dementias and melan-

cholias. The drink attack may come on after regular or irregular intervals, and resembles epilepsy in its sudden, convulsive manifestations and terminations.

The alcoholic is a continuous drinker of wine, beer, spirits and other forms of alcohol, as luxuries, beverages or medicines, in small quantities daily. He is literally a toxemic, from poisons introduced into the body from without, and poisons formed by chemical combination within, producing most complex disturbances and degenerations.

The early symptoms are always obscure, and often limited to an exalted *ego*, in which the person revels in the thought of his superior ability and conviction that spirits have no injurious effect and that his will-power is amply able to control its use.

After a time disturbances of nutrition and circulation appear, vitality is lowered and efficiency diminished, then come rheumatism, neuritis, and disturbances of the heart, all of which are attributed to over-work, nerve exhaustion and other causes.

Kraepelin of Heidelberg, some years ago, made an exhaustive study of the effects of alcohol in small doses on healthy persons. These studies gave the first distinct data and explanation of the obscure early symptoms noted in alcoholics. He found that from one to two drams of alcohol in a healthy person lowered the sensory activity to a measurable degree, and that alcohol was never a stimulant, but always an anesthetic, depressant and cumulative in its action. Other studies in this country and Europe have not only confirmed this but brought out a wealth of facts opposed to all the teachings of the past.

Kraepelin also showed the effects of alcohol on sight, diminishing its capacity, as well as obscuring the color sense, also on hearing, and proved that it was lessened;

that taste, touch and smell were all more or less impaired. Impressions on the brain-through the senses were imperfect and could not be corrolated because of the impaired and weakened functions.

Clinical observations of patients who come to hospitals and sanatoriums show diminished sensory, motor and mental activity, that can be measured and stated in exact terms. This condition is practically a palsy, which increases with the continuous use of spirits. The conclusion was that alcohol even in small doses, was an anesthetic, either for a longer or shorter period. Some illustrations bring out this fact.

A noted astronomer declared that every time he took a glass of wine or beer his work for a few hours after was full of errors and had to be repeated. He had to give up banquets and dinners in which wine was served, and announced that he had found from personal experience that all use of spirits was injurious.

In one of the large observatories in this country, there is a specific rule that assistants and observers must abstain from spirits, coffee, tea and tobacco. This is a recognition of the action of alcohol and its injurious effects on all work requiring accuracy of the senses and reason.

In the musical world Sousa's band and other orchestras illustrate this same fact in their experience. No member is permitted to drink spirits, or even wine or beer, and is required to abstain from tobacco and be abstemious in the use of coffee and tea. The reason given is that these drugs impair hearing and the accuracy of the sense of harmony and melody, as well as lower the muscular control of the fingers and lips.

Familiar examples are becoming more and more prominent in the management of railroads, and the increasing inconsistency of all officials and operators in the train serv-

ice be total abstainers. Thus everywhere in practical life the anesthesia of alcohol is recognized and becomes more and more apparent in the mistakes and errors that are traceable to its use. Numerous degenerations constitute a more or less prominent symptom in alcoholics.

Alcohol as a dehydrator interferes with protoplasm, destroys its integrity, and deranges the circulation. Vasomotor palsies noted in the face are common. Derangements of the kidneys and digestion with diarrhea, constipation, fermentations, accumulations of gas are also frequent. With this there is distended stomach, weakened heart's action, high tensioned arteries, which can be noted in the early stages. All these symptoms steadily increase and are marked by low vitality, nervousness and symptoms of fatigue that are unusual. Explanations of over-work, neurasthenia and other diseases are given. Then comes bacterial invasions with local inflammations, traumatisms which make a profound impression on the body.

Recovery from wounds is slow and so-called neuralgic pains with great debility follow. At this stage drug taking is very likely to develop, both directly and indirectly from thoughtless prescriptions of the physician. In reality, it is toxemias within the body, increased by the toxic poisons from without that become active and predisposing causes of profound degenerations, both local and general.

The inebriate presents many of the same symptoms, only they are intensified and develop into a convulsive obsession for spirits, up to the point of stupor. This morbid impulse to secure narcotic effects is peculiar to alcohol and some drugs. After a time it dies away, then various local inflammations appear, such as gastritis, local irritations of the kidneys marked by excretions of albumen and salts, heart feebleness and mus-

cular fatigue. These symptoms pass away, and a period of abstinence follows, in which there seems to be a full return to previous health and vigor. Then all unexpectedly some complex symptoms appear, which are followed by another drink paroxysm.

Sometimes this period is prolonged for several days and weeks, in which the person drinks to stupor every day, then suddenly the end comes, and with it melancholia, remorse and profound conviction that he will never drink again. Often local inflammations begin and run a mild course. In this there is distinct physical and mental degenerations. The reason is faulty in some ways, and clear in others. Physical work is done automatically and with a returning vigor many symptoms disappear or are suppressed, so as not to attract any attention.

The drink convulsion is most complex and confusing noted by exhaustion and mental derangement. The free interval may not exhibit any of these symptoms. The person may do good work along accustomed lines. Many persons realize during this free interval, signs of debility and exhaustion, others do not, but claim to be perfectly well, and show a paretic exaltation and confidence in their perfect health that is suspicious.

The inebriate is potentially a maniac of the epileptic class, and the paroxysms, while due to a great variety of unknown causes are very largely influenced by toxemias and faults that are preventable. The drink paroxysms are often followed by most serious diseases of the lungs, kidneys, liver and heart. Consumption and pneumonia are more or less common in inebriates. When the drink craze subsides pneumonia develops and is literally a pneumo-paresis and paralysis of the branches of the pneumogastric nerves.

Consumption and inebriety are very close.

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ly related. The subsidence of one is followed by the development of the other. In the alcoholic the continuous use of spirits favors the erosion of the lung tissue and diminishes the protective power of the phagocytes. The breaking down of the lungs in an alcoholic is always fatal. It is not so in the inebriate.

The excessive use of spirits to the point of stupor for a time has some deterrent effect. When this stops, a fresh onset of the disease follows. There are a great many curious facts not yet studied, concerning the relation of inebriety and tuberculosis. In my book on "A Clinical Treatise on Inebriety"<sup>1</sup> some of these facts are described.

Cirrhosis of the arteries and liver is another degeneration closely allied and associated with inebriety. During and after the paroxysm they are very prominent, but later they diminish in a large measure. There is a great wealth of facts along these lines that has not yet been studied.

The inebriate not infrequently develops paranoiac symptoms during the free interval. He displays fears and phobias; consults physicians, takes drugs and furnishes remarkable examples of recoveries supposed to be due to certain particular remedies.

It is at this time that medical men fall into many errors in both diagnosis and treatment. Not infrequently a young man will discover a few form of brain and nervous disease, and give some very exact studies, which he asserts are new to the literature. Almost every year something of this kind appears. Enthusiastic credulous men will make confirmatory studies, but in the course of time they soon pass away.

Critical inquiry will show that many of these marvelous instances occur in inebriates, and the symptoms noted were only

seen in the free interval, and later, the drink paroxysm and other symptoms overshadowed the first description, hence they disappeared.

Delirium tremens are not very common in inebriates, and when they occur, they are so complicated with manias and delusions as to often be mistaken. In the alcoholic, delirium tremens is quite common. This is a low degenerative type, with partial recovery, but continuous degeneration.

The alcoholic may have stages of delirium, called tremens many times and apparently recover. In the treatment most disastrous results have followed, particularly in inebriates. Here the deliriums and delusions are so prominent, that the thoughtless physician gives all his attention to producing sleep. The theory that if this can be accomplished a subsidence of the acute symptoms will follow, has resulted in high mortality. Different forms of opium in such cases are particularly dangerous in depressing the heart, below the point of recovery.

Hyoscine seems to perpetuate delirium and mental derangement and fix it in some unknown way. Many cases are noted where hyoscine was given, causing temporary sleep, but leaving the brain clouded for months and years afterwards.

Other cases were noted where opium was given freely, and recovery followed, and an addiction to opium developed. Delirium tremens in both the alcoholic and the inebriate mark a stage of degeneration from which very serious troubles, both mental and physical begin. The inebriate may develop into an alcoholic and the former free intervals be obliterated, but an early desolution of most pronounced disease is certain to follow.

The alcoholic sometimes becomes an inebriate, and there is a suspicious after history of such a person, that calls for the most

<sup>1</sup> Published by Harvey Publishing Co., Cincinnati, Ohio.

careful study. Most complex forms of mental and nervous diseases, always gather about persons of this class, and the exact diagnosis is impossible, except in a very general way.

Cerebral hemorrhage is a common termination in such persons. Traumatisms both physical and psychical assume great importance, and usually end fatally. A very important fact should not be overlooked, and one that has a great influence on the after life, is the early use of spirits before and during the adolescent period. Persons who begin to drink about this time are much more seriously affected than those who begin later, and this fact has a very pronounced influence in the prognosis. Heredity is a general factor, present in a very large number of persons. Notwithstanding the denials, statistical studies furnish unmistakable evidence, that the largest number of ineptiates and alcoholics have a history of wine and beer drinking in early life, particularly at the table.

Some of these patients continue to use spirits in small quantities up to middle life, then break out in the most complex neuroses and psychoses, terminating fatally. Others develop some form of disease earlier and become invalids or hospital patients.

Every exact clinical study brings out this fact that the use of alcohol for any purpose and for any length of time, becomes an active and contributing cause for degenerative diseases of a great variety. Of course there are great differences in susceptibility. A sturdy German family may have beer on the table from infancy up and in early or middle life but the degenerations which follow may not be very prominent. There can be no question that vitality is diminished, mortality is greater and susceptibility to disease is marked. In an American family, where wine is given daily to the children,

disease and mortality is very sharply defined and in early and middle life they are practically invalids of an incurable class.

The stupid error still prevails, that the toxic action of alcohol is a transient condition and leaves no impression that is injurious on the organism, also that the continuous use of small quantities of spirits in no way impairs the health and normal activities of the body and mind. This is flatly contradicted by laboratory and clinical studies. Persons who have drank to great excess, meaning that they have become stupid, delirious and otherwise intoxicated, then recover and assert with great positiveness that they are perfectly well, and have in no way been injured by it, are practically hypnotising themselves with conclusions that cannot be verified.

Physical and psychical studies reveal shadows and defects both of the mentality and senses that are not always clear to others. Such persons have lost the fine appreciation of their relations to others, of their own conceptions and pride of character for truthfulness and honesty. If they continue to drink at long intervals, these shadows become more prominent. There is credulity, skepticism and degrees of faulty judgment. If a brain worker, his product is inferior, if a muscle worker, he lacks much of his former efficiency.

A noted judge who at long intervals drinks at banquets to a marked degree, was found afterwards to be duller and harsher in his judgment and decisions. They were overruled. His former high standard of accuracy and clearness had dropped down.

A physician, who occasionally drinks to excess is becoming more and more careless of his diagnosis and treatment; he is less politic in his relations to his patients. His appearance is lacking in his former neatness and care. A business man who drinks at

intervals shows faults in his judgment; he is more credulous or skeptical, less cool and collective and complains of conditions that did not disturb him before. These are all facts which a close scrutiny will reveal.

The alcoholic particularly shows marks of decline both physical and mental. He may be able to keep up his work, but there are defects which are called weaknesses. He may have sudden phobias for wealth by any sort of method or political preferment, and want to lead in society and churches, and show an ambition that is reckless of results. The inebriate may exhibit equally strange variations and paranoiac notions, and changing conceptions of politics, religion, science and business. Frequently the extremists and radicals of new movements are inebriates, whose attacks are concealed, and not considered prominent by their friends.

In the commercial world these degenerations are recognized. Thus the mercantile agencies rate men low who drink continuously or at intervals. This is the result of experience, showing instability of character, conduct and control, and financial weakness that is growing. The bonding companies do the same thing in their refusals to take risks on inebriates or alcoholics. In all this there is an expression of experience, reduced to monetary values and without any sentiment or theory.

In institutions for the care of inebriates the same fact appears in many ways. On admission every patient presents palsies, defects and degenerations, which are inexplicable, except as due to the anesthesia of spirits.

The persons who are treated are of all others the most skeptical of the damage and injury which they are suffering from. They possess a delusive egoism that they are very little changed and can recover by appeals

to the will. The inebriate, during the free interval is often more clear as to his real condition, but lacks control, is unstable and subject to suggestions, both physical and mental.

The alcoholic is more profoundly wrecked in mind and body, but this is covered up with the same egoism and delusion.

The quack theories of producing an eversion to alcohol in a brief time and calling this a cure has done irreparable damage, not only to patients but to the unthinking public. The inebriate will give up the use of alcohol on the subsidence of the paroxysm naturally, but this is not restoration. Any drugs given at this time, or any sort of treatment is often credited for results which they did not produce, but on the contrary protracted and hindered the natural progress of the case towards restoration. The alcoholic, after profound elimination through the skin and bowels finds relief in drugs of a narcotic character, but this is limited.

Sanatorium treatment, in which every person receives the same medicine at intervals, and are treated alike, is empiric and very likely to be followed by results more serious than the original disease. The present empirical treatment has done a great deal to develop an army of incurables which became criminals, paupers and demented. It has also done a great deal to educate the public as to the possibility of physical help and restoration. It has revealed the fact, so long doubted, that both the alcoholic and inebriate are curable in the best sense of that word.

Everywhere it is apparent that the number of these drink and drug neurotics is increasing. Physicians are unable to meet the demand for help, hence hospital clinics and measures and means of every kind and

description are sought and patronized with the hope of securing some results that will be practical.

In my experience of over forty years I have had the satisfaction of noting a large number of persons permanently restored, from physical treatment, in sanatorium, also from home and office care. No percentage of recoveries can be given with any reasonable accuracy at present, but personal studies of individuals, show that restoration and recovery ought to be the rule and not the exception, and farther on, when these neuroses are recognized they will be preventable and curable the same as other diseases.

Finally the degenerations preceding and following the alcoholic and inebriate, are not incidental or accidental or matters of chance, but follow a uniform positive growth and development. They begin at a certain point and go on in a regular order of progression, which can be studied and understood. No treatment limited to a few days or weeks gives any promise of permanency. Restoration may follow from the subsidence of the peculiar prominent symptoms, but other causes are active, which must be neutralized and broken up before any results will follow.

There is a home and office treatment, which should precede sanatorium care, and not infrequently physicians can use means and measures here, most effective. There are possibilities of home treatment that we do not realize at present, and there are equal possibilities in sanatorium and hospital treatment of permanent restoration and cure, beyond any present conceptions. The stupid theories of vice, depravity and moral weakness as explanations of why men drink have prevented any recognition or study, until these theories were obviously absurd. Such theories are the man who

drinks wine at the table, or beer and spirits, or the man who drinks at intervals to intoxication are all moral defectives, or if not that, are well within the range of rational control and free will, hence have no medical significance. The prevalence of such theories has built up an enormous army of neurotics, and degenerate psycho-neurotics, who only come for help and treatment when they have reached terminal stages and are in the incurable classes.

We sit around and observe this army being recruited, developed and trained and grown, to the neurotic stage, where their disabilities are so evident as not to be mistaken. Then we make great efforts to use medical means, always reserving the theory that it was vice at the beginning.

A large class of inebriates and alcoholics are ranked among the incurables, yet notwithstanding this fact, there are degrees of curability and examples that are startling in the possibilities that they reveal.

We ought to recognize the gravity, not only of the neuroses and toxemias in the later stages, but these conditions at the beginning, and the possible means of prevention and correction. No physician in general practice can fail to realize the increasing neuroses and degenerations which follow from the use of spirits, and no physician can fail to understand the actual condition both physical and mental, which presents itself.

How to remedy it, how to advise, prescribe and plan means of restoration and cure, is largely unknown, and yet every physician can do this and can find a field for practice with results as positive as from the treatment of any other disease.

Home and office treatment of this class will be a prominent feature of the practice of the future physician. I repeat the same plea and claims which I urged long ago,

that this neglected army of degenerates should be recognized, studied and treated, above all theories and sentiments, and that they can be cured and restored, to an extent not at present dreamed of.

## CHANCROIDS AND THEIR TREATMENT BY THE GENERAL PRACTITIONER.

BY

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The term chancroid has many synonyms: soft chancre, soft sore, *ulcus molle*, simple chancre, non-infecting sore, simple venereal ulcer.

Chancroid, chancre, cancer and canker are all derived from the same word. The term chancroid, which means chancre-like, was introduced by Clerc, and the world owes him no thanks for this addition to medical nomenclature. For the term is an incorrect and confusing one and has been the cause of a great deal of unnecessary misery and maltreatment. No matter how we may try, we cannot help the association of ideas which is called forth by the association of sounds. And when you tell a patient that he suffers from chancroid, he involuntarily connects it with chancre and syphilis, and it requires quite some effort to dissociate the two in his mind. Besides, patients will come to the doctor and tell him that years ago they had a chancre, when as a matter of fact they had a chancroid, but they cannot be blamed for confusing the two similarly sounding afflictions. And the doctor will be misled, and wishing to be on the safe side, will insti-

tute specific treatment, to the great detriment perhaps of the patient. It is one of the most unfortunate terms in our nomenclature, but I suppose it would be useless to attempt to displace it, though it can do no harm to try.

Chancroid is a contagious, autoinfectious venereal ulcer, not followed by constitutional symptoms. It is due to a specific bacillus discovered by Ducrey in 1889, in chancroidal pus, and later by Unna in scrapings from chancroidal ulcers. It is referred to as the Ducrey or Ducrey-Unna bacillus. At the present writing the specificity of the Ducrey bacillus, which was long denied, is thoroughly established and can no longer be questioned, because all the four requirements of Koch have been complied with. The bacillus has been grown on artificial media and inoculated successfully on human beings by numerous investigators, but the last proof of its specificity has been furnished by Nicolle and Blaizot who inoculated monkeys with the virus, then obtained the bacilli in pure culture, with which pure cultures they produced typical chancroids both in man and in animals.

The bacillus is 1.5 to 2 m. long and 0.5 m. broad, with rounded or square ends and a slightly constricted center. While it stains readily with methylene blue, the best stain is Unna's specific polychrome methyl blue.

It must be borne in mind however that chancroid is often a mixed ulceration and a smear from a chancroid will generally show the presence of numerous streptococci, etc. The streptococci generally outnumber the specific streptobacilli, and a diagnosis from the smear alone is often very difficult.

Chancroid unlike chancre confers no immunity; some of the older physicians in their experimental enthusiasm and in the belief that the inoculation would confer im-

munity from syphilis inoculated themselves with chancroid, as many as two to three thousand times.

*Period of incubation.*—The period of incubation of chancroid is variable, but short. A man may have intercourse in the evening and awaken in the morning with a chancroid; but generally the period of incubation is between three and five days. Exceptionally it may be as long as ten to twelve days.

*Situation.*—The coronary sulcus is the favorite situation of chancroids in the male, the introitus vaginae in the female. But it may be situated—either primarily or by autoinfection—anywhere on or near the genitals, the root of the penis, the scrotum, the abdomen, the thighs, the anus; and also on places remote from the genitals, such as the fingers, the feet, the mouth, etc. In short, just as we have extragenital chancre, so we may have extragenital chancroids.

Can a woman herself free from chancroid infect a man with the disease? This is a question which we are called upon to answer frequently. The answer to this question is, yes. A healthy woman has intercourse with A who is suffering with chancroid. He deposits the chancroidal pus or bacilli in the woman's vagina. In an hour or so she has intercourse with B, and he may become infected, while she remains perfectly free. In this case the vagina merely served as a depot for the chancroidal pus, the vagina being more resistant to chancroidal infection than is the penis or urethra. And if the woman takes a plain or antiseptic douche after the second intercourse she may never have a trace of the disease. This explains why so often, on confrontation, we find the woman who is the unquestionable cause of a man's infection, perfectly free from disease.

### The Treatment of Chancroid.

The treatment of chancroid depends upon the chancroid—its situation, size, age, tendency to spread, freedom from complications. It will also depend upon the patient's position, whether he can stay home and attend to himself regularly, or whether he must be working all day. The treatment may have to vary from one very mild to one extremely severe and energetic. In by far the largest percentage of cases however I found the mild measures amply sufficient.

If the patient can stay home, then wet dressings are the best throughout the treatment. At the first visit I wash all the sores and the surrounding healthy skin with a 1:1000 hot mercuric chloride solution, and wrap the penis in gauze soaked in a solution of aluminum acetate. And the patient is ordered to keep these compresses on all the time, pouring some of the solution from the bottle onto the gauze so as to keep the latter wet all the time. It is best not to remove the gauze too often, as this interferes with the healing process. Fresh gauze once or at most twice a day is sufficient. Under this treatment most cases of chancroids will heal rapidly.

If the patient must attend to his daily work, in the shop, factory or office, he is ordered to use the wet dressings in the evening and at night, applying a powder during the day. Of powders we have a large choice, and any of the following is satisfactory: calomel, calomel and bismuth subnitrate—equal parts, airol, aristol europhen, chinosol and boric acid (chinosol 1 part, boric acid 9 parts). None of the powders just enumerated quite equals in efficiency the old iodoform, but to use this powder on private patients is entirely out

of the question. One might as well put a label on the patient stating: This gentleman or lady is suffering with venereal disease. Iodoform should be used only on hospital patients or patients confined to their room. The powder is to be protected with some gauze. If there is a tendency for the gauze to stick to the powder and the underlying tissues, so that its removal causes pain and bleeding, then it is well to cover the gauze with some white petrolatum or to soak it in liquid petrolatum. But ointments are not to be recommended. They are the least satisfactory of all applications, and are to be selected as a last resort. In chancroids of the meatus a small plug of cotton soaked in an antiseptic solution (aluminum acetate) is to be kept within the meatus and changed after each urination.

Chancroids of the urethra occur but rarely without chancroids of the penis. The latter are treated in the regular way, and for the urethral chancroids the urethra is irrigated every 3 hours by means of a soft rubber recurrent catheter attached to a four ounce hand syringe, with potassium permanganate solution, 1:5000, or chiniosol solution 1:1000. Instilling into the urethra a few drops of a solution of iodoform or europhen in olive oil (5 per cent.) is also very useful and often hastens the healing process.

While under the treatment as outlined above the majority of chancroids will heal satisfactorily, there are cases which either on account of some special virulence of the chancroidal bacilli or on account of the general rundown condition of the patient refuse to heal; refuse to heal and keep on spreading further and further. Or the patient may come to us in a condition of phagedenic ulceration, when the chancroids

threaten to destroy the penis and neighboring tissues. In such cases cauterization is indicated. I am opposed to the use of the actual cautery or the Paquelin. Pure nitric acid answers the purpose quite well. The lesions are cleansed with hot bichloride (1:1000); if they have the remains of powder and dried crusts on them these are to be removed first with soap and warm water; pledges of cotton soaked in a 10 per cent. solution of cocaine are then applied to every chancroid, to every bit of raw surface, and kept on for ten minutes. The point of a thin tooth pick (much preferable to a glass rod) is then wrapped in a small wisp of cotton, dipped in pure nitric acid (*acidum nitricum U. S. P.*) and applied well to every lesion. If this is done carefully the nitric acid does not spread to the sound tissue, and it is not necessary to catch the excess with blotting paper (there should be no excess), nor is it necessary to protect the healthy tissue with some fat or petrolatum, as is usually advised, though of course there can be no objection to doing so. The cauterization is complete when the entire surface of the ulcer or ulcers has turned deep yellow or brown. If the patient should complain of pain, the cauterized part may be wrapped in cotton saturated with a 5 per cent. cocaine solution. The penis is then wrapped in cotton or gauze wet with lead water (*Liq. Plumbi Subacetatis Dilutus*) or lead and opium wash (*Lotio Plumbi et Opii*) for about an hour. After that the regular treatment for chancroids outlined above—wet dressing or powders—is proceeded with.

Cauterization should not be resorted to when not indicated; but when indicated it should be done thoroughly or not at all. A second cauterization is a very sad thing, and argues incompetence on the physician's

part. Besides the additional suffering which it—a second cauterization—causes the patient, it is seldom of value.

There are certain ill-smelling, phagedenic cases of chancroids, which are resistant to all kinds of treatment, but yield to the old well-known chlorine water. I use it full strength (Aqua Chlori U. S. P.) and the compress need be kept on only for a few hours; sometimes an hour or two makes a very decided improvement.

To illustrate the treatment of chancroids by two or three examples:

*Case A.* Two chancroids in the sulcus coronarius. Duration two weeks. Only slight tendency to spread. Prepuce freely movable. Has been using on a druggist's advice carbolic ointment. I washed the penis with soap and water, and applied pledgets of cotton soaked in 1:500 bichloride solution. Removed them in five minutes. Then painted the chancroid with tincture of iodine, which caused quite some pain for about two minutes. This pain is due not so much to the iodine, as to the formation of mercuric iodide. Ordered to keep penis wrapped in gauze soaked in solution of aluminum acetate. The gauze was to be kept wet all the time if possible. Under this treatment the chancroids healed completely in twelve days.

*Case B.* Physician. Several coalescing chancroids in sulcus coronarius. Duration three weeks. Had been circumcised in childhood. Treated himself with lotio nigra and lotio alba, and with calomel in substance, but with no benefit. On the contrary his condition got worse, and there was considerable pain, also tenderness in the groin, presaging buboes. Treatment: Thorough cocaineization by means of pledgets of cotton saturated in a 10 per cent. solution of cocaine hydrochloride. Pledgets of cotton soaked in 1:500 sublimate solution for half

an hour. Painting with tincture of iodine. After that preliminary treatment, the patient was to use nothing except gauze compresses soaked in 1:1000 chinosol solution and kept constantly moist. Under this treatment a complete cure was effected in three weeks.

*Case C.* Patient has had chancroids for eight weeks. Different applications, powders, ointments and lotions were used, but chancroids kept on spreading, until one-third of the glans had been destroyed and chancroids have an angry look and secrete profusely. Penis swollen and painful, and there is severe pain on urinating. Examination shows also the presence of chancroid in the urethra and in the meatus; the meatus widely gaping due to destruction of tissue. The denuded glans is so painful that the gentlest touch of the sores sends the patient almost into convulsions. An attempt to urinate apparently causes the patient acute suffering. Urine loaded with pus and shreds.

Treatment pursued. Thorough cocaineization of the glans penis with 10 per cent. cocaine solution. Then touched every chancroid sore on the penis with nitric acid on a bit of cotton wrapped around sharp pointed toothpicks. Towards end of cauterization began to feel severe pain, but this was at once stopped by a second application of cocaine. As this was late in the evening, told him to go to bed at once, to wrap penis in gauze compress of aluminum acetate solution and pour some of the solution on the compress several times during the night; whenever he should awake. Cauterization of chancroid sometimes causes an edema and even a lymphangitis of the penis, but this is prevented by the application of aluminum acetate compresses. This was the only treatment for the external chancroids. The following evening

I cocainized the urethra and the meatus, syringed the anterior urethra with a 1:2000 bichloride solution, and ordered urethral injections of 1:1000 chinosol three times a day. A plegget of cotton saturated with solution was to be kept constantly in the meatus. In spite of the irritation of the urine, the urethral chancroids healed more rapidly than did the external ones. After the scabs from the nitric acid fell off, in about three days, the surface showed healthy granulations and the process of healing progressed satisfactorily; but having reached a certain point there was still a sore about three-fourths of an inch in diameter—the healing stopped and the epidermization would go no further. I applied liquid phenol with no result; a 10 per cent. solution of silver nitrate was but little more efficient. Copper sulphate in 5 per cent. solution proved satisfactory and the treatment resolved itself into touching the lesions with copper sulphate in 5 per cent. solution once a day, and keeping wet compresses of aluminum acetate solution day and night. The cure was complete in six weeks; of course there is a scar on the anterior surface of the glans penis, the meatus is somewhat gaping due to lost tissue, and there is a slight diminution of the lumen of the urethra at the site of the urethral chancroid, but otherwise the patient is well and has no trouble either with his micturition or his sexual function.

#### Chancroids with Phimosis.

When a man with a tight, long, non-retractable prepuce has the misfortune to get chancroid at the coronary sulcus, or if the chancroid causes such inflammation and edema that the prepuce becomes phimotic, we have a very disagreeable condition to deal with. Here those who for religious or

hygienic reasons were circumcised in their infancy have a great advantage over the non-circumcised. Chancroid in the circumcised is never the same serious affection that it is in the non-circumcised, never reaches the same distressing number and dimensions, and never drags in its wake so many complications. The tightness of the prepuce causes a phimotic condition interfering with the circulation, the accumulated irritating secretions from the ulcers form ideal conditions to prevent the chancroids from healing, and it is here that we still occasionally see the horrible pictures which used to frighten us and turn our stomachs in the old text-books and atlases of venereal diseases, namely the penis increased to three or four times its normal size, intensely red, or partly red and partly cyanotic, with a part of the glans and the prepuce eaten away, with purulent urethral secretion due to secondary infection, with painful buboes, etc., etc.

The proper method of dealing with chancroids which are complicated with either a congenital or inflammatory phimosis, is to make them accessible to proper treatment. We attain this result best by making two lateral incisions through the foreskin, which give us an upper and a lower flap, and freely expose the glans. In milder cases we need not hurry with the incisions. There are also instances where the patient at first absolutely refuses an incision. In such cases we irrigate the preputial orifice with hot mercuric chloride solution (1:5000) or chinosol solution (1:1000). The irrigations should be performed very frequently, every hour, every half hour, continuously, if possible. Or the penis may be given a continuous hot antiseptic bath. This treatment not only has a good effect on the chancroids, but acts beneficially in reducing the edema and inflammation, thus

reducing the phimosis and making the lesions more amenable to treatment.

If after one or two days of this treatment the phimosis is not reduced, and the chancroids are not fully accessible, we cleanse the penis and irrigate as well as we can the preputial opening with bichloride (1:5000), infiltrate the prepuce with one-fourth per cent. cocaine solution (or Schleich's solution) along the lines, where we wish to make the incisions, and with a pair of phimosis or bandage scissors, cut on each side right through to the sulcus. The hemorrhage is quite free, but it need not frighten us. It relieves the inflammation and edema, and when the dressing is applied it is applied snugly enough to control the bleeding. No stitches are applied to the cut edges, but the wound is thoroughly irrigated with hot bichloride (1:5000), and an aluminum acetate compress is applied and over it a snug bandage. For the first twelve hours after the operation, we may with advantage use a powder (one of those mentioned above) and a dry dressing, instead of the wet compresses.

#### The Treatment of Chancroidal Buboës.

The best treatment of chancroidal buboës, as of many other sequelae and complications, is to prevent their formation. And one should be justified in considering the frequent development of buboës in patients who have been under a physician's care from the beginning, a reflection on that physician. It would indicate too violent, too irritating treatment, or failure to instruct the patient in the proper precautions to be taken. If a patient comes to us with the signs of commencing bubo or buboës, the proper thing is to put him to bed

and have him apply the following ointment.

Ung. Hydrargyri .....	3ij	(8.0)
Guaiacol .....	3ss	(2.0)
Ichthyol .....	3i	(4.0)
Adipis .....	3x	(40.0)

To be well applied 2 to 4 times a day and covered with cotton.

If the patient cannot stay in bed, let him do as little walking as possible, and let him use the above ointment covered with cotton, which is to be held in place with a bandage or adhesive plaster.

As long as there are no signs of suppuration, this treatment should be followed faithfully. I have seen the resolution of many buboës under its influence.

But when suppuration is present, the attempt at resolution is of course useless. And the treatment is then as follows: The skin over the bubo is gently but thoroughly disinfected with hot bichloride (1:1000); a few minims of a weak cocaine solution (one-fourth per cent.) is injected at the site of the intended incision, or the skin is sprayed with ethyl chloride. If the fluctuation is distinct then a small one-fourth inch incision is made over the most prominent part; if the suppuration is diffuse then several incisions or punctures are made, and the pus is squeezed out. The cavity is then irrigated thoroughly with hydrogen dioxide, followed by solution of mercuric chloride (1:5000). The irrigating solution is gently squeezed out, the field is dried and the cavity is injected with a 5 per cent. solution of iodoform in sterilized olive oil or almond oil. Several layers of cotton and gauze are laid over the wound and held in place by a bandage or adhesive plaster.

Instead of the iodoform-oil, a few drops of silver nitrate solution (10 per cent.) may be instilled. This is claimed by some (Lang

of Vienna) to give excellent results, but I could not convince myself of its superiority.

The dressing is changed once or twice daily, and if the healing progresses satisfactorily, nothing more, except changing the dressings, need be done. If there is however an abundant accumulation of pus, if other glands are breaking down, then the irrigation with hydrogen dioxide and bichloride, and the filling of the cavity with iodoform-oil must be repeated.

During the time of operation and during the process of healing of the incised bubo, the penis is to be kept wrapped up in wet antiseptic dressings (bichloride), so as to prevent infection of the wound by the numerous pathogenic organisms of the chancreoidal ulcerations.

If the wound is slow in healing, the edges should be brushed over with a strong silver nitrate solution (20 per cent.) or with a copper sulphat stick.

The removal of the entire pocket of inguinal glands which used to be practiced frequently and is still practiced occasionally is a brutal measure, may lead to dire results (edema of the penis, scrotum and lower extremities, the wound may refuse to heal for months and years), and it should not be necessary ever to resort to it.

12 Mount Morris Park W.

#### MEDICAL SUGGESTIONS.

Ill usage or frights are often factors in the insanity of children. The ill effects of fright culminating often in mania and in acute stupor.

Tincture of guaiacum given in half-teaspoonful doses every two to three hours, well diluted with water, is a remarkably efficient remedy for all inflammatory disorders of the throat. Give until it purges, and then decrease the dose.—*Med. Summary.*

## FURTHER OBSERVATIONS ON SCOPOLAMINE-NARCOPHIN ANESTHESIA DURING LABOR WITH REPORT OF TWO HUNDRED (200) CASES.<sup>1</sup>

BY

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Scopolamine-morphine, later scopolamine-narcophin anesthesia during labor has been successfully used by Krönig and Gauss in Freiburg in over six thousand (6,000) cases. A method which has stood the test in such a number of cases, and which has the stamp of approval of such men, may be considered to have well passed the experimental stage.

Steinbuchel first tried scopolamine-morphin in 1902 in some twenty cases and reported favorably. However, not until Krönig and Gauss had undertaken it, and elaborated a technic, did it attract much attention. Gauss report his first five hundred cases in 1906, and again reported five hundred cases in 1907. Newell of Boston also reported one hundred and twenty-one cases in 1907 with excellent results.

Among those who opposed this method of narcosis during labor, Hocheisen stood foremost. He condemned it as dangerous to mother and child, after using it in one hundred cases at the Charité in Berlin in 1907. Gauss maintained that Hocheisen's technic and preparation of the drug were at fault. In other words, the untoward symptoms in mother and child noted by Hocheisen, was not due to the fault of scopolamine, but to faulty scopolamine.

Gauss insisted that only partial narcosis is necessary, a degree of narcosis causing analgesia and amnesia, and rightly named "Twilight" or "Dammerschlaf." For this

<sup>1</sup> Read before Bronx County Medical Society, Wednesday, Oct. 21st, 1914.

state, only small doses are necessary, and not the large doses used by the opponents to "twilight."

We are all aware that pain of whatever nature is purely a mental phenomenon. The painful sensation is conveyed to the brain by a sensory nerve fibre, and from there a motor impulse is sent out. The pain of childbirth, which is caused by the pressure of the fetus on the nerves and plexuses of the birth canal, during its passage, by the dilatation of the cervix and the lower uterine segment, and finally by the stretching of the very sensitive perineum is also conveyed to the brain, by sensory nerve fibres, and from there motor impulses are sent out to the uterine and abdominal muscles to help expel the cause of pain, the fetus.

Every one having observed a woman in labor will bear me out, that, the increasing pain, as labor advances, which, while in a great measure is due to the increase pressure and stretching of the birth-canal, is also due to a great extent, to the vivid recollection of the previous pain. The woman begins to resent the pain before the actual pain takes place. She fears the coming pain, because she remembers the preceding one. Therefore, any drug or drugs, which may be capable not only of making the existing pain easier, but also of causing her to forget the preceding one will be the greatest boon that can come to womankind.

Scopolamine-narcophin anesthesia or "twilight sleep," during labor as elaborated by Gauss and Krönig accomplishes just that. It puts the woman in a semi-conscious state, causing analgesia and amnesia, without interfering with the normal and natural process of labor and without causing any harm to either mother or child.

**Drugs and Preparation.**—Scopolamine and hyoscine are considered chemically identical by U. S. Pharmacopea. Thatcher also

maintained that they are identical. This drug, however, as sold in the market is often very impure, and even the pure drug reacts differently on different individuals, due to the fact, that the drug deteriorates in a very short time. Gauss, Newel, Beruti and Siegel have put great emphasis on the necessity of obtaining the pure drug and having a reliable, stable and standard solution. Straub devised a method of preparing this drug by adding to the solution manit-alcohol, thus making the scopolamine stable or scopolamine-haltbar as he calls it. This preparation is put up in ampule form and has been found by Siegel to be effective even after standing one and one-half years.

Of the two hundred (200) cases of "twilight" at the Jewish Maternity Hospital this preparation was used in 180 cases and we can substantiate all that is claimed for it.

In the earlier experiments of Krönig and Gauss, morphine was used in combination with scopolamine. Gauss found that though morphine has never caused any serious danger to either mother or child, it still had a tendency to have a depressing effect on the respiratory centre of the infant, so that oligopnea was rather more common. Schlimpert showed that by the use of narcophin this unpleasant symptom may be avoided. Narcophin is a synthetic preparation of opium discovered by Straub and consists of a chemical combination, which contains, to each molecule of meconic acid, a molecule of morphine and a molecule of narcotin. This preparation has more of a narcotic effect due to the increased amount of narcotin and less of a depressing effect on the respiratory centre, because it only contains 31.2% of morphine by weight. The chemical formula is as follows:



At the Jewish Maternity Hospital we began to use scopolamine-narcophin during

labor about four months ago. We were very fortunate in having been able to obtain the cooperation of Dr. Kurt E. Schlossingk, a co-worker of Krönig and Gauss, who is fully familiar with the Freiburg technic so essential to the successful administration of "twilight." The early cases, numbering about fifteen, were not very successful, the percentage of total failures was high, and in two cases the state of restlessness and excitation was extremely annoying. Upon investigation by Dr. Schlossingk he found that the fault was with the preparation. We were then using a solution of hyoscine and morphine prepared by a local chemist. After obtaining scopolamine-haltbar, however, using narcophin instead of morphine, our results markedly improved. Observing the marked difference between the first 15 cases and the succeeding ones, one could not help but be impressed with the great importance of using a reliable and stable preparation; one can also easily account for the many failures reported by obstetricians in this country and abroad who used this method several years ago, but many of whom were compelled to abandon it as unsuccessful and dangerous, on account of the tendency to cyanosis in the child and hemorrhage in the mother. An unstable preparation and large dose of scopolamine, and repeating the dose of morphine were the causes of the untoward symptoms.

**Technic.**—No less important than the reliability of the preparation of the drug is its mode of administration. At our hospital we carry out the technic of Krönig and Gauss as used at Freiburg. "Twilight" should only be started in a woman in whom active labor has begun. By active labor we understand the occurrence of uterine contraction regularly every 5 minutes in a primipara or every 5 to 8 minutes in a multipara. This is a very important point to ob-

serve, because, scopolamine-narcophin when given too early may cause a complete cessation of labor pains. The cervix should be soft and thin and about 2 fingers dilated. Pulse, temperature and respiration and fetal heart should be carefully examined before each injection. The injections are best given intramuscularly, preferably in the gluteal muscles. The woman is put to bed in a quiet room. The room is darkened, all external noise is excluded, a trained nurse and experienced physician is in constant attendance from the first injection until the birth has taken place. The first dose consists of one cc. of a 3% aqueous solution of narcophin which equals one-half a grain of the drug and through the same needle one and one-half cc. of scopolamine-haltbar is injected which equals to 0.00045 or 1/133 grain of the drug. One hour after the first injection a second injection of 0.00015 or 1/400 grain of scopolamine is given. No more narcophin is used. About one half hour after the second injection, the memory test is begun. According to Gauss the success of the entire technic stands or falls with this test, as the subsequent dosage and intervals of injection depend upon it. Some object is shown the patient, a toy, a watch or the like and in 25 minutes the patient is asked as to whether she remembers having seen it, if she does not remember the condition desired is obtained. One may wait one-half hour or even in some cases one hour before another dose of 0.00015 of a grain of scopolamine is given. It is however, very important not to ask the patient too many questions, because she may awaken, if only for a few minutes; she then forms what Gauss calls an "isle of memory," and any pain which takes place during this time, becomes fixed in her brain, she remembers it. Now if during labor several such "islands" form, she will connect them and believe

that she has felt *all* her pains, in spite of the fact that you may be sure that about 19/20 of the time she was deeply in "twilight sleep." The succeeding doses are administered from time to time as the condition of the patient demands, usually every one to one and a half hours. The effect of the drug begins to manifest itself about one-half or one hour after the first injection. The patient begins to feel drowsy, she sleeps between pains, the face flushes, the pupils dilate. Later on the skin becomes dry, the lips parched, the patient asks for water and this is given as often as she desires. Full "twilight sleep" usually takes place between the second and third and often between the third and fourth injection. Her speech then becomes incoherent, muscular actions are incoordinate. She answers questions in a rather indifferent way. To one not familiar with "twilight" phenomena, the intervals of pain appear longer and the duration of each shorter; this is due to the fact that the woman feels only the acme of each pain, while the beginning and end of each pain is not appreciated by her. This is easily proven by feeling the uterus during the pain. The uterine contractions are felt before there are any manifestations on the part of the woman. There are women who manifest so little pain even during the second stage, that if careful watch is not kept on the perineum, the baby may be found in bed. In rare cases, when the expulsive pains are extraordinarily severe, this may tend to arouse the woman from her "twilight" state. These pains become fixed in her memory. In such cases about 10 cc. of ethyl-chloride inhaled from an open mask may be advisable. In our series of cases, we did not find it necessary to use it in more than five percent. The patient being very susceptible to the influence of light, it is advisable to cover her eyes with a

towel especially during the expulsive stage. When the child is born, the cord is hastily clamped and cut, and the child is removed to another room in order that the mother shall not be awakened by the child's cry. The patient usually continues her sleep for from one to several hours. When she awakens, she has absolutely no recollections of what has transpired since the moment she got in her "twilight sleep," nor has she knowledge that birth has taken place. She is very much surprised when informed that her baby is born, and is often very sceptical about it.

In thus analyzing a successful "twilight" case, we find that we have a method at our disposal which robs childbirth of its greatest terror, namely pain. The pains leave no impression on the brain centres, she not only does not remember them, but she has not perceived them either. Birth really has taken place as a reflex act.

Siegel in his latest report of 220 cases carried out at Freiburg, recommends a new technic more definite and simplified.

The first dose consists of

1½ cc. of scopolamine = 0.00045 and 1 cc. of narcophin = ½ a grain.

In ¾ of an hour 1½ cc. of scopolamine = 0.00045.

In 1½ hours a half cc. of scopolamine = 0.00015 and ½ cc. of narcophin = ¼ grain.

In 3 hours, one-half cc. of scopolamine = 0.00015.

In 4½ hours, one-half cc. of scopolamine = 0.00015.

In 6 hours, one-half cc. of scopolamine = 0.00015 and ½ cc. of narcophin.

In 7½ hours, one-half cc. of scopolamine = 0.00015.

In 9 hours, one-half cc. of scopolamine = 0.00015.

In 10½ hours, one-half cc. of scopolamine = 0.00015 and ½ cc. of narcophin.

Form 512-5 M.-11-14.

History No. ....  
Twilight No. ....

# Jewish Maternity Hospital

## DAMMERSCHLAF (TWILIGHT)

Class .....  
Service of Dr. ....

Name ..... Address .....  
 Age ..... Single ..... Married ..... Para ..... No. of Children Living .....  
**Condition on Admission:** Heart ..... Lungs ..... Oedema ..... Bleeding .....  
 Pains began ..... Character ..... Frequency ..... Duration ..... Location .....  
 Cervix condition ..... Dilation ..... Membranes .....  
 Presentation ..... Position .....

		INJECTIONS						
		1ST INJECT.	2ND INJECT.	3RD INJECT.	4TH INJECT.	5TH INJECT.	6TH INJECT.	7TH INJECT.
TIME								
DRUGS								
DOSE								
P. T. R. Blood Pressure	P. ....	B.P. ....	P. ....	B.P. ....	P. ....	B.P. ....	P. ....	B.P. ....
	T. ....	T. ....	T. ....	T. ....	T. ....	T. ....	T. ....	T. ....
	R. ....	R. ....	R. ....	R. ....	R. ....	R. ....	R. ....	R. ....
Foetal Heart								
Cervix {	Condition							
	Dilation							
Membranes								
Pains {	Frequency							
	Duration							
	Character							
State of Patient {	During Pains							
	Between Pains							
Amnesia								
Analgesia								
Skin								
Pupils								
Speech								
Muscular Action								
Pitultrin								
Dose and Preparation								
Pains								
Frequency								
Duration								

Delivery	Time	Spontaneous	Instrumental			
Placental Delivery	Time	Spontaneous	Crede Manual			
Hemorrhage P. P.						
Perineal Laceration						
Resuscitation						
Child Cried Spontaneously		Oligopnoe	Asphyxia			
Duration of Labor	Total	1st stage	2nd stage	3rd stage	Duration of Twilight	
Awakened	Hour			Amnesia		
REMARKS:						

He thus recommends a definite dose at a definite time, and repeats the narcophin at every third injection but only gives half the original dose. He claims equal success with this new method and recommends it because no individualization is necessary. We tried it only in two cases. We noticed an increased cyanosis in the baby and we thought it advisable to give it up for the present.

*Duration of Labor.*—Most observers contend that labor is somewhat prolonged by "twilight." Siegel of Freiburg states that in his experience, the first stage is prolonged by a little over an hour, and the second stage by 33 minutes. The average duration of labor in our first 150 cases in primipara was about 8 and one-half hours. We must, however, admit that this is rather inconclusive. Most of our cases arrived at the hospital when already in active labor. The patient was not able to give the exact time of its onset. In the next 50 cases we were able to get the exact time of the onset of labor, and we found that the average duration of primipara was eleven and one-third hours, the first stage of labor as compared with cases where no "twilight" was given, having been shortened. This may be attributed to the fact, that, narcophin and scopolamine having a softening effect on the cervix, permitted a more rapid dilatation. The second stage of labor is prolonged from one-half to one and one-half hours. This is due to the fact that, the woman in her "twilight sleep," is not able to utilize the abdominal muscles that usually are so helpful during the expulsive stage. However, this slight prolongation of the second stage should not be a drawback to the practice of this method, because, in itself, it does no harm to either mother or child, and a slightly prolonged painless labor, is to be preferred to a shortened pain-

ful one. In pituitrin we now possess a drug, which, when properly and judiciously used, can more than overcome this loss of time.

*Placental Delivery.*—In our series of cases we did not meet with a single instance where the placenta was retained longer than one-half an hour. The usual time of its expulsion was between 10 and 20 minutes; in the majority of cases, the placenta was expelled spontaneously; in the others the use of a slight Crede was sufficient.

*Hemorrhage and Uterine Relaxation.*—A great and serious objection raised by the opponents to "twilight," is uterine hemorrhage and relaxation. It is difficult for us to understand it. *We did not meet a single case in our entire series where hemorrhage was at all alarming.* In fact it appeared to us that, if anything, the hemorrhage was rather less than formerly; nor was there any uterine relaxation. Subinvolution took place as usual.

*Forceps.*—Of the 200 cases, only 22 were terminated artificially,—about 10%; 3 by breach extraction; 3 by medium and 16 by low forceps. In an equal number of cases at our hospital without "twilight" forceps were used in greater number of cases. Even this number of forceps could have been reduced to about half had the attending obstetrician been a little more patient. Krönig lays great emphasis on the fact that "twilight" reduces the percentage of forceps because in the absence of appreciation of pain, with its consequent exhaustion, the patient may be permitted to take a little longer time to deliver herself.

*Laceration of the Perineum.*—According to all authorities, laceration of the perineum does not occur as often during "twilight sleep," because the perineum stretches more slowly. Haraar and McPherson reported 37 lacerations in 100 cases with

"twilight" as compared to 45 without. In our series of cases, the number of lacerations were less and the degree smaller.

Of the total number of cases treated at our hospital with "twilight" we have primipara, 150; multipara, 50.

*Presentation and Position.*—We had 4 breech, 4 occipito-posterior. The rest were all anterior positions. Two were twins.

*Counter-indications.*—According to Kröning and Gauss, primary inertia is the only counter-indication to "twilight." We have also included as counter-indication the following: Placenta previa, contracted pelvis and eclampsia, because of the usual high fetal mortality in these conditions. We had four cardiac cases in our series. All seemed to have benefited by the "twilight sleep," owing to the lessened amount of shock and exhaustion.

*Results.*—In 168 cases or 84 percent. we succeeded in obtaining complete amnesia and analgesia. The entire time the patient was under "twilight" was effaced from her memory; she remembered neither pain nor the actual birth. In 15 cases or 7½ per cent. the success was only partial. The pain was lessened, but there was no amnesia. This was due to the fact that in most of these cases "twilight" was started too late. In 17 cases, or 8½ per cent. we had total failures. The drug had no effect at all, but it is also important to remember, that the drug had no bad effect either.

When we take in consideration our first 15 cases on whom an unreliable preparation of hyoscine was used, we may reasonably hope with the present excellent preparation at our disposal, to reduce the percentage of failures quite considerable. One must expect, however, that a few failures will always occur, because of the variation in the sensitiveness of the nervous sys-

tem and to the idiosyncrasy of some individuals to these drugs.

*Child.*—One of the greatest objections to the use of "twilight" has been asphyxia of the child, and one can readily account for the great amount of asphyxia that was encountered, when one considers the excessive dosage and unstable preparations used. Those that followed the exact technic of Gauss, in regard to dosage and time of administration, and those that were careful in selecting a reliable stable preparation very seldom met with asphyxia in children. In our entire series of cases, we had three still births, and three died, one at 12 hours and one the third and one on the fourth day. Of the still births, we were fortunate to obtain two post-mortems. One case showed an unusual condition. There was an entire absence of the left part of the diaphragm and only a rudimentary left lung. The lung was the size of a small bean. The left pleural cavity was occupied by small intestines, appendix, large intestines, stomach and spleen. The right pleural cavity contained the heart and the right lung. The second case showed congested vessels of the pia and marked edema of both temporal lobes. The third case was that of hydroamnion. The child showed a good deal of maceration, though the attending physician was sure of having heard the fetal heart three hours before delivery. Of the three children that died shortly after birth, one case was a premature baby in the eighth month, with a spina bifida and died three hours after birth. The second died three days later from melena neonatorum; in this case there was a family history of bleeders. The third died from apparently subdural hemorrhage. No autopsy. Even if we should credit three of these cases to "twilight," the one from apparent subdural

hemorrhage, the edema of the brain, and the hydro-amnion case, our percentage of child mortality would still compare favorably with the ordinary fetal mortality of one and one-half per cent. Fetal heart in utero on repeated examinations was never found above 160 or below 120. One hundred and sixty-five children cried spontaneously. In 29 there was a delay of five minutes. These children were not asphyxiated, but were in a state of what Gauss calls oligopnea. The child at birth will take a deep breath or even cry out, then the respirations become shallow and slow. Heart slows down to about 30 or 40 per minute and the child takes on a cyanotic appearance. According to Gauss, the explanation for this is, that scopolamine exerts an influence on the vago-tonus and the respiratory centers. On account of this, the child requires more carbon dioxide in the blood to stimulate the respiratory center. Gauss and Siegel maintain that these children should be left alone and will come around all right in at most, 10 minutes. The respirations will become deeper, heart improves, cyanosis disappears and the child is soon normal again. However, we believe that it is better practice to use light resuscitation than to wait, because no harm can be done by a little flagellation while much valuable time may be lost by "watchful waiting."

*Post-partum Period.*—The post-partum period in the entire series compared most favorably with an equal number of cases without "twilight." Shock and exhaustion so often found especially in the highly nervous and in the weak and anemic women during the first few days of their post-partum period was markedly absent in our "twilight" cases. As soon as they awaken from their sleep, they feel so well that they like sitting up in bed and many ask to be permitted out of bed on the second or

third day. This can only be attributed to the analgesic and amnesic state during labor.

#### CONCLUSIONS.

(1) Scopolamine-narcophin narcosis during labor when properly used, has no danger for either mother or child.

(2) The patient, in her "twilight" state, should be constantly and carefully watched by a trained nurse and experienced physician.

(3) Pulse, temperature, and respiration of mother and fetal heart should be carefully examined especially before each injection.

(4) Amnesia can be obtained in 85 per cent. of the cases and analgesia in almost all the cases when used in time.

(5) The first stage of labor is not prolonged.

(6) The second stage is slightly prolonged.

(7) Perineal lacerations are lessened by its use, and the use of forceps is reduced.

(8) Cardiacs are benefited by "twilight."

(9) "Twilight sleep" does not interfere with any operative interference which may be found necessary in order to terminate labor.

(10) There is absence of shock and exhaustion and the puerperium is favorably influenced by it.

(11) It is best suited for hospital practice. When used in private homes, proper surroundings and assistance should be provided.

(12) There is no uterine hemorrhage caused by this method.

*Final.*—This is an era of therapeutic rationalism. Remedies are given, not because they are recommended by, or said to be valuable by some authority. Their use appeals to medical men only because of their

knowledge of the physiological action of the drug, the pathologic condition of the patient and the therapeutic problem to be solved.

If my humble remarks will stimulate my colleagues to try this method and convince themselves of its efficiency, my little effort will be amply rewarded.

"In pain thou shall bear children" was the sentence imposed upon women more than fifty-six hundred years ago. Were this sentence even then a just one, it is high time that it was commuted.

1057 Hoe Ave.

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## THE NEED OF PERIODICAL MEDICAL EXAMINATIONS.

BY

S. S. GOLDWATER, M. D.,  
Commissioner of Health,  
New York City.

The average length of life has risen from approximately twenty years, in the sixteenth century, to approximately forty years, at the present time. An additional gain of from two to five years can be made if our knowledge of disease and of the premonitory signs of disease is universally applied in an intelligent way. If this is true, the duty of the departments of health, which are the official guardians of the lives and health of the people of the cities is clear; the department must assume the leadership in this great movement for the preservation of health and the prolongation of life.

Certain diseases are communicated from individual to individual. To the protection of the community from these diseases, and the prevention in this way of disastrous epidemics, health departments have hitherto largely confined their efforts. Surveying the present situation one perceives that

from this point of departure some progress—though far from enough—has been made. The inspection of school children was originally undertaken for the purpose of discovering and isolating contagious diseases; today an effort is made to discover and correct physical defects before it becomes impossible to restore the afflicted one to health.

Furthermore, a field has been found for useful medical work and legislation, in connection with occupations where conditions exist which are inimical to life, limb and health. To the promotion of child hygiene it is now proposed to add the teaching and enforcement of adult hygiene. Instead of the control of a few distinctive occupational diseases it is intended to control all disease which is controllable.

When tuberculosis was first made notifiable by law, it was assumed that the key to the tuberculosis situation had been discovered. All cases were to be reported, and sooner or later, in one way or another, all reported cases were to be cared for. The registration of cases of tuberculosis has now been in vogue for a number of years; thousands of cases have been segregated, in many cases the disease has been arrested, the life of the average tuberculosis individual has been greatly prolonged, and the mortality from this disease has been further diminished.

But despite all this, tuberculosis is not today under full medical control for obvious reasons. A doctor cannot report a case of tuberculosis until he finds it, and in spite of all the teaching and preaching of the past decade, many patients do not seek medical advice until it is too late.

Ask any physician, examine the records of any tuberculosis clinic, and you will discover that most victims of tuberculosis recognize their need for treatment far too late; in the meantime these tuberculosis in-

dividuals take no precautions whatever for the protection of their families or fellow-workers. It is plain that the spread of tuberculosis can never be checked until a way has been found to discover every case of pulmonary tuberculosis in its incipient stage.

The cancer death rate steadily increases; we rejoice at the organization of a society whose aim is to teach the public how to recognize the early symptoms of the disease and to make everybody understand the surgical relief which should be instantly sought, once the symptoms are recognized. The need for this teaching, arises from the fact, that the cancer victim too often seeks surgical relief when it is too late to prevent the disease from becoming fatal.

No one can doubt, that the Society for the Control of Cancer will accomplish much good; but in a larger sense, its failure is inevitable, because working people who have character and strength of will, and who are struggling to support their families, will make light of premonitory symptoms and will avoid the doctor and the hospital until forced by sheer physical exhaustion to quit work.

Attention has been called repeatedly to the increasing mortality from disease of the heart, blood-vessels and kidneys. The death rate from diseases of the heart and kidneys has approximately doubled during the past thirty years. These diseases, together with cancer and tuberculosis, are the despair of hygienists.

If we do not know how to prevent them, we know at least how to recognize them in their earlier stages, long before their victims are incapacitated, and in a large percentage of cases we can postpone their serious development, promote the comfort of the individual and prolong his working life.

While the State of New York has already undertaken the supervision of certain dangerous trades, with a view to the prevention of occupational diseases, it is recognized that many occupational or vocational diseases now escape attention, and hospitals are being urged to look more carefully into the occupational histories of their patients, in order that our knowledge of this subject may be enhanced.

By this means the range of recognized occupational diseases will doubtless be widely increased, and the field for the legislative and administrative control of injurious vocations will be correspondingly widened.

Unfortunately, the discovery, by means of the analysis of hospital statistics of occupational tendencies which are injurious to health has its limits. The patient who enters the hospital for treatment is, as a rule, already damaged beyond repair; dispensary patients, as a class, are less seriously injured, but even these do not and cannot receive, under our present methods, the full measure of protection which medical science affords.

Preventive methods should deal with the individual who has not yet been driven to the dispensary or hospital for treatment.

To what extent are industrial workers physically impaired? A striking and pathetic answer to this question is to be found in the records of the Joint Board of Sanitary Control of New York City. Under the direction of this board eight hundred garment trade workers were examined—sixty-two per cent. of those examined were found to be in need of medical treatment. In a similar investigation in Germany fifteen diseases or conditions of physical impairment were found among every ten workers examined.

In a recent examination of the employees of a New York City bank one hundred per cent. of the employees were found to be abnormal, and liable to suffer from diseases of the heart, lungs, kidneys or blood-vessels. In the light of such evidence as this, can it be maintained that preventive medicine is properly organized "to curtail and if possible, to prevent disease, to prolong existence, and to render life happier by means of improved physical conditions?"

To prevent or control disease three measures are necessary, education, which is essential to an understanding of the dangers which the individual encounters; regulation, to prevent environmental conditions which are inimical to health; periodic medical examination, a necessary test of the value and effectiveness of education and of sanitary regulation.

Preventive medicine cannot do its utmost good until physicians are regularly employed by the entire population, not merely for the treatment of acute and advanced disease, but as medical advisers in health. Only by means of this can we insure the automatic discovery of the beginnings of disease, and especially, the beginnings of such diseases as cancer, heart disease, hardening of the arteries, degeneration of the kidneys, and tuberculosis, which contribute so largely to present mortality, and which, if not always avoidable, are in a large majority of instances, deferable. To this end the departments of health in our cities are bound to direct their energies, not as the competitors of the private physician, but as his ally, and as the friend, adviser and protector of the people at large.

For the contribution which the physician will thus make to human life and human comfort he should be properly educated. The attention of the medical student should

be directed to the beginnings of disease as carefully and as persistently as it is now directed to those diagnostic signs and symptoms which are indicative of incurable pathological processes, and of acute self-limited diseases.

To sum up then, it is proposed that a complete physical examination, by a qualified and duly licensed physician should be provided every individual in New York City at least once a year. Whoever has the means should see to his own protection. The state and city already charged themselves with the examination and protection of children in public schools; in future similar protection must be given to everybody.

For the purposes of medical examination it would be wise to organize workers in groups corresponding to their employment, since in this way diseases due to occupation would be automatically disclosed. The government, national, state or municipal, should see to the protection of its own employees, just as many private corporations and firms have already provided for the protection of theirs.

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Whenever there is danger of metastasis from mumps, either to the mammary glands or to the testicle, apply a hot mustard poultice over the parotid gland and put the patient to bed for a few hours. The inflammation will be attracted to its original site and there remain, and will abate with proper treatment.—*Dr. Ellingwood.*

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The cystoscope and a rectal examination offer the most exact means of determining the size of the prostate. One cannot but believe that measuring devices are the inventions of men possessing but slight acquaintance with the cystoscope.—*Am. Jour. of Dermatology.*

**THE PASSAGE OF GALL-STONES.**

BY

GRANVILLE S. HANES, M. D.,

Louisville, Ky.

In connection with the finding of gall-stones in the bowel: About three years ago a husky looking gentleman appeared at my office complaining of considerable irritation about his anal opening. He was so sensitive that I made no effort to introduce my finger into the rectum. I thought probably he had an acute infection, such as we oftentimes encounter about the anal orifice, and it would be an unnecessary punishment to introduce anything into the bowel. I advised that an operation be performed, to which he readily assented because of the intense pain from which he suffered.

In a day or two the patient was taken to the hospital, and much to my astonishment, after he was anesthetized and a dilator had been introduced, a large gall-stone was found in his rectum. This man said that, three or four months prior to my seeing him, he had a terrific attack of pain in the hepatic region in consequence of which he was in bed a week or two. My interpretation was that the hepatic flexure of the colon was situated high in the abdomen, that there was an ulceration between the gall-bladder and the colon, and this large stone escaped from the gall-bladder into the large bowel. I do not believe the calculus could have passed through the small intestine without causing obstruction. It was landed, you might say, into the rectum at once. He perhaps had a sensitive anal canal and could not exert sufficient force to expel the stone through the opening. There is no question that this stone was so large that it would not have passed the ileocecal opening. The calculus was not faceted, which is evidence that he had just one large

stone in his gall-bladder, which passed into the large intestine as stated. He has never had any hepatic symptoms since the attack herein mentioned.

**THE ANNOTATOR**

**Tetanus and Gangrene in War.**—The fragmentary unofficial reports from the battle zone, indicate that tetanus and gangrene are more prevalent than in any previous wars. The first aid packets supplied to each soldier, or at least supposed to be in his possession, are either not used or are inefficient. It seems that the trouble arises from the necessity

of fighting in trenches to a greater extent than ever before and in highly cultivated soil. The tetanus bacillus is said to flourish best in garden mould at a depth of eighteen inches, and perhaps also the other bacilli which are the causes of gangrene. The soldiers have no bathing facilities so that it is practically impossible to keep garden mould out of their wounds. A certain percentage of them are certain to be infected. Of course the sensible thing to do is to give a prophylactic dose of the serum to every wounded man, but the impossibility of reaching him in time and the enormous numbers to be cared for, seem to render this treatment impracticable. The surgeons are compelled to wait until symptoms appear and then do the best they can. This has led to research work to find a serum which will be effective in the later stages of tetanus. Press dispatches seem to indicate that this has been successful and that the French are now using it. We fervently hope these rumors are true, for such a serum would undoubtedly rob tetanus of its horrors. We often, perhaps generally, do not recognize it until too late to do any good. Prophylaxis is impractical and sterilization of a wound is never complete, so we need a sure cure when the infection has developed marked symptoms.



**The Probable Length of the War.**—A medical journal has no call to discuss such a matter as to how long the organized

murder is to continue in Europe, particularly since equally able military experts have come to such divergent conclusions as three months and three years. But we are interested not only as human beings but as physicians

and must be pardoned if we seem wandering from the straight and narrow path of the strictly medical. We have been bold enough to state that the war was unavoidable, and since then we have not read a word as to how it could have been prevented. Of course it is all very well to say that the belligerents should not have fought but men do not lie down when they think the existence of their country is threatened or its prosperity or even its ambitions. National disasters mean personal suffering or death to loved ones and men have always been willing to die for their kin. If the war was unavoidable we ought to be able to guess as to when peace is likewise unavoidable. Either side will stop of course when its fighters are killed, dispersed or captured as happened to our own southern brothers in 1865. Wars do not go to that extreme any longer, but end when one side or both find themselves at the end of their resources. We now hear that stored ammunition is being so lavishly expended that the continuance of the struggle depends upon importations of lead, copper and nitrates. One mathematician has calculated that so far it has taken 168 pounds of metal to kill a man, which is said to be far less than in the Civil War. At that rate the war depends wholly on the ability of the belligerents to keep their trade routes open. Then there is the need of rubber and gasoline, both of which are said to be enough for a year or so, though there may be only enough for a few more months. Food and clothing do not bother either side since the soldiers do not use more than they do in peace—indeed the deaths will make the supply last longer. Thus we must count on a long struggle, with the possibility of a sudden unexpected cessation of it at any moment—and that is as near as any man can guess. Therefore we will be dependent

on our own resources for certain medicines an indefinite time. The sooner we realize this, the better it will be.



**Our Increasing Murder Rate.**—Statistics compiled by Frederick L. Hoffman, of the Prudential Life Insurance Company, show that our unenviable reputation for murder is growing worse rather than better. No doubt statistics are becoming more accurate and may give a false impression of an increase, but that does not excuse us for having more mur-

ders than any other civilized nation. The rate in New York City in 1913 was six times that of London, three times that of Berlin and sixty per cent. higher than in Paris. In the decade ending with 1912 the worst eight cities were in the south, but perhaps this is due to the negroes more than to climatic unfitness of whites. In New York we are prone to blame the white element from central or southern Europe, who at home resort to murder for trivial causes. Milwaukee, the city of beer, had the lowest rate in the above decade, but St. Louis, its rival, had the eighth highest. So we cannot blame this beverage no matter what we may think as to spirits. What is the cause, anyhow? Why are we so lawless and murderous? There is no use of sermonizing over it until we know the relative frequency among the various races. There is some slight suspicion that race for race we are not much worse off than in the countries from which we are derived. We doubt for instance whether Norwegians commit any more murders here than in Norway, and we are quite sure that negroes do less killing in America than in the Congo. Civilized influences do help the savage, but the change to America may not change the already civilized, except to bring out the primitive instincts in limited areas of new country where law is not yet established. The point we wish to make is this, our murder record may be basically racial, and not due to our deplorable habit of acquitting murderers. The public has been aroused and its opinion has been expressed to the effect that every murderer sane or insane

must either be executed or put where he cannot do it again, except of course the rare instances of the defense of self or family. We all had fondly hoped juries had so reflected this opinion that murders were becoming less common. We are therefore, so much chagrined at Hoffman's figures that we would like to have them proved factitious,—that is, the apparent increase the result of the increasing accuracy of the returns rather than to any actual increase of murder.

**Starving School Children.**—When a few sociological workers announced a few years ago that fully 10% of the school children of every city were underfed, there was universal skepticism, but later investigations proved that the distress was underestimated. Dr. W. W. Roach of Philadelphia reported in

*School Progress* that fully a third of the pupils of the Wood School, mostly Poles and Italians, were underfed. He started a daily school meal of milk and cereal at 10.30 a. m., with marvellous improvement in health, weight and scholarship, showing how little is needed and yet creating amazement that the parents cannot or will not supply it. English boarding schools for boys were notoriously bad at one time on account of the poor food, because the masters saved some money by cutting down the meats, but in family life it is a matter of ignorance or poverty. The subject has been given worldwide discussion, and all sorts of schemes have been suggested or tried to remedy the dreadful conditions. We were under the impression that there had been some improvement, but recent reports raise the suspicion that the state of affairs in New York City is as bad as ever, many children being actually hungry when they leave home for school, and at least 5 per cent. showing signs of anemia or defective development. What is the matter? The reports merely state the facts and do not go into the causes. A few cases are explained as due to the death of the father and the insufficient income of the mother but what about the cases where the father does have employment? Is it possible that he cannot make enough money to feed his own children. We hope

this side of the matter will be studied. We have referred to it before and will again, with the hope of discovering exactly why so many parents permit their children to starve. It is high time that the law be changed so that parents if responsible can be locked up for cruelty and their children taken away from them, but if the parents are blameless let us acknowledge that the condition is an irremediable one—a natural law based on the freedom to marry and produce a family whether or not we can support one. We ought not to drift along as we have, but must find the causes of social ills so as to remove them. Charity now merely nibbles at the Herculean task of trying to remedy the results and does not hint at prevention—at least in this line. In primitive times people killed the babies which could not be supported, and killed the old folks also. The genius of civilization is to prolong every life to its maximum, but can it really save all those whose parents cannot feed them?



#### **Smallpox among Anti-vaccinationists.**

—The late John Alexander Dowie was a crazy man, who created considerable notoriety because of his religious vagaries. His successor as leader of the colony at Zion City, Ills., is one Wilbur Voliva, among other things, an ardent anti-vaccinationist. As a result of "depending on the Lord" for protection,

there has been an epidemic of smallpox in the congregation. The basis of modern sanitation is the fact that the Lord helps him who helps himself, and the community which takes the proper precautions seems to receive the blessings of Heaven until its cup runneth over. Churches, therefore, are strongly in favor of Health Departments and not only agree with us that cleanliness is next to godliness, but are also in favor of a practical application of the newly discovered ways of combatting infections. In fact the union between clergymen and physicians is far closer than generally believed. Medical opposition to religious dogma has about vanished, and religious opposition to modern medicine is rarely found except among Dowieites and other illogical fanatics.



The incident will of course be ignored by other anti-vaccinationists, and indeed it is said to have failed to convince Voliva of the error of his ways. It looks as though we are to have smallpox with us always, but there is no special cause to worry over it. If a man has sense enough to be vaccinated properly he is safe, and can make his children safe. Only the fools die and some men are cruel enough to say the world would be better off without such illogical folks. Still we cannot help pitying the babies who are needlessly sacrificed, but what can be done if compulsion is resented?



**Street Accidents.**—In the first ten months of this year, 276 children were killed in the streets of New York City by vehicles, two-thirds being the results of automobile accidents. Most of the deaths were of children less than sixteen and an attempt has been made to blame the drivers who should have been on the look-out. Children have no

judgment or very little and as many of them have no other place to play except the streets, it is assumed that they have prior rights. In other parts of the world, the opposite assumption is made, for it is alleged that the sidewalks are for people and the streets for vehicles. If a person is run down in the streets it is his own fault and he might be punished, while severe penalties of course are levied upon a driver to invade the sidewalks. This is all very fine theoretically but the dense population of New York City has created new conditions. The motor or horse vehicle has the prior right to be in the street but the children must go there too, as there is not room enough for them on the sidewalks and we have provided no other place. The National Highways Protective Society has suggested that children on roller skates be confined to the sidewalks and crossings. This will reduce the fatalities some, but the statistics do not tell us how many of the deaths are due to this cause. Perhaps we will be compelled to exclude all vehicles from certain crowded streets except possibly horse-drawn ones going at a walk. It might help

if the police were to make spot maps of all vehicle accidents for both adults and children and make a study of the conditions where the most occur. The chauffeur may not be so careless as we usually assume in case of accidents. Pedestrians are often dreadfully careless, utterly oblivious of danger when they cross places in midblock reserved for vehicles. Considering the chances taken by children, it seems that 276 deaths, though appalling in the aggregate, are proportionately very few. There are no available figures for comparison, but it seems on a rough guess that an equal percentage of children in the villages of the country meet violent deaths of this sort. The chauffeurs seem to be very careful and skillful to have prevented innumerable accidents, and we ought to give them full credit. Many of them have babies of their own and are not the careless tribe so often assumed.

#### Medical Inspectors for Sunday Schools.

—We have recently learned that in a certain city not so very far away, some evidence pointed to Sunday schools as having been the means of spreading the infection of scarlet fever. There were many other opportunities, of course, for children to assemble in close contact and infect one another, but the interesting

point is the great care we are taking to prevent the spread of infection in day school and more or less ignore the other dangers, particularly Sunday schools, children's parties and moving picture theatres. There is still considerable difference of opinion as to when scarlet fever is most easily transmitted, but the weight of evidence so far seems to point to the early days even before the eruption is out. Many competent men are denying that the desquamated skin is the carrier, but it would be folly to act on such an opinion until they present irrefutable proof, and that cannot be done until we find the germ and learn its habits. The only safe course at present is to consider a case dangerous from the beginning of symptoms to the end of desquamation. We have therefore taught the day school teachers to be



on the lookout for illness in a pupil and to send it home if there is even a suspicion of fever and refuse readmission until the health officer permits. So successful have we been in convincing school authorities that infection is generally transmitted directly from the sick to the well in more or less close contact, that there has been a notable reduction of the amount of disease contracted in schools. There is justifiable amazement therefore that health authorities have not yet compelled Sunday schools to exercise similar care, particularly since the children are in far closer contact than in day schools. Now here is a field for a little practical religion on the part of the medical members of the congregation. Let them take turns in attending Sunday school to exercise a little supervision and give advice. Why not start a church clinic for the littlest ones not yet in the day schools? It seems only common sense that the law as to certificates of health and vaccination should be applied to Sunday schools as well as day schools, but we can scarcely expect it for awhile. What we can expect and insist upon, is some check to the absolute freedom which is now enjoyed by ignorant mothers, to send to Sunday school those children who are in the beginning of illness or who are still dangerous though convalescent. We hope some clergymen will take up this matter with the superintendents of their Sunday schools and the doctors in their congregations.

valescent no matter whether from disease or trauma, must have his nutrition pushed to the limit of his digestive powers, for it is solely a question of bringing reparative material to injured or exhausted cells. If his digestive powers are so greatly reduced that they are overtaxed by the food needed for the cells, then we must digest it for him until they can do the work. In any case the patient must have food which does not disgust him, as one of the proved facts of physiology is the influence of savor and taste in digestion. We have heard of giving corned beef and cabbage to a woman on whom a laparotomy has been recently performed—and she hated the stuff even when well. More recently we learned of food so coarse that the patient—a refined feeble old gentleman—could not eat it, and the meat was too tough to cut except by a razor edge. No one expects charity patients to be given expensive dainties, nor will the scanty funds of public institutions permit any except cheap staple articles, but five dollars a day ought to buy proper food for pay-patients. Room rent and nursing do not absorb nearly all of it. In other words, we are much afraid that the wonderful advances in dietetics are not being taken up by all hospitals as well as might be. There are rather ugly rumors of other remediable defects in private institutions, but the diet alone should warrant an investigation. Some sort of public control or supervision seems to be a necessity. We are controlling all other public utilities, why not the hospitals also?

#### The Diet of Surgical Convalescents.—

We have recently learned that in a certain private hospital of high-standing the feeding of convalescent surgical cases is sadly neglected,



and the hint is thrown out that this is deliberately done to increase the dividends of those staff doctors who own some of the stock. We hope this is an error, and indeed we ex-

pect it is, but such accusations ought to come from within the profession rather than from without. The only thing we can accept as true is the evident fact that diet is not being given the professional supervision its vital necessity demands. The con-

The following prescription says, Hinsdale has in many instances proven of great value in the treatment of valvular heart disease associated with a mild degree of failure of compensation:

B Caffein citrate ..... 3ss.  
Strychnine sulph. .... gr.  $\frac{1}{3}$ .  
Sparteine sulph. .... gr. iii.  
Ft. caps. No. xii. M. Sig.—One capsule every three or four hours.

This formula is taken from Anders, and has proven beneficial in several cases which resisted practically every other prescription. "The above prescription is not only a good heart tonic, but also a good diuretic."—*Med. Standard.*



## SUNLIGHT IN THE TREATMENT OF TUBERCULOSIS.

New York, Nov. 9, 1914.

To the Editor

AMERICAN MEDICINE,  
New York City.

In an editorial in your esteemed journal of October, your associate editor, Dr. Woodruff, indulges in personal references because of a difference of opinion as to the value of heliotherapy in tuberculosis and the communicability of tuberculosis as an infectious disease. I refer to the editorial comment entitled "Is the Consumptive Dangerous?"

Dr. Woodruff has, of course, a perfect right to have his own views on the value of sunlight in tuberculosis, on the infectious or non-infectious character of the disease, and on the wisdom of a public anti-spitting propaganda, but when he expresses these opinions he should not cast slurs on an opponent's work but confine himself to a scientific discussion. It sounds as if he were trying to renew an old controversy between himself and me when in reference to my address delivered at Saratoga Springs before the health officers of the State of New York (*Medical Record*, Oct. 10th, 1914) on the subject of "The Tuberculosis Problem in Rural Communities," he says: "We are glad to see that Knopf makes no mention of sunshine as a preventive or cure and has abandoned his dangerous sun baths."

From the subject of my Saratoga address above mentioned, it is obvious that I had no occasion to speak of therapeutics. I still believe in the beneficial influence of sunlight and judiciously administered sun baths in tuberculosis and many other diseases.

Six years ago, when Dr. Woodruff first expounded his anti-solartherapeutic the-

ories, I sent a circular letter to 44 of the leading tuberculosis specialists in this country and abroad asking them if sunlight was harmful if judiciously employed as a therapeutic agent in tuberculosis. All of them replied with a decided no, and the majority ascribed to sunlight a marked beneficial influence as a therapeutic agent in tuberculosis. Reprints of the above article, entitled "Explanation of Seeming Paradoxes in Modern Phthisiotherapy," which appeared in the *New York Medical Journal* of September 12th, 1908, as well as a subsequent contribution "Sunlight and Tuberculous Disease," which appeared September 26th, 1908, in the same journal, are at your or your readers' disposal if you or they wish to read the complete answers to my letters of inquiry. Aside of a few of our greatest teachers in medicine, like Sir William Osler, Professors Biggs, Jacobi, Tyson, and the late Dr. Musser of Philadelphia, all replies were sent to me by men who have made tuberculosis a life study, who are active sanatorium directors, dealing constantly with the question of prevention and cure of tuberculous diseases. They look upon sunlight as a therapeutic factor, not only in pulmonary but in all kinds of tuberculous diseases. I emphasize "a" therapeutic factor and not "the" therapeutic factor, for every conscientious therapist will individualize in selecting his curative agents, and sunlight is no more a cure-all than anything else thus far discovered to be of benefit in tuberculosis.

Since the publication of the articles above referred to in which I believe I have shown conclusively the error of Dr. Woodruff's ideas expressed in his attack on heliotherapy in tuberculosis, there have appeared countless contributions showing the value of sunlight in tuberculosis of all types. Really wonderful cures have been produced by heliotherapy in Dr. Rollier's sanatorium at

Leysin, Switzerland, and equally gratifying results have been obtained in our own country at the Sea Breeze Sanatorium on Coney Island. Excellent reports and illustrations of the work of these two institutions appear in Hinsdale's prize essay "The Atmospheric Air in Relation to Tuberculosis," published recently by the Smithsonian Institution, Washington, D. C. And only last week there appeared a most valuable contribution on the subject in the *Survey* (Oct. 31st) under the title "Letting the Sun Cure Tuberculosis in Children," by Paul E. Betzell, executive secretary of the Buffalo Association for the Relief and Control of Tuberculosis.

So much for the value of sunlight or sun baths to which Dr. Woodruff rather scornfully referred in his editorial. Rather amusing is the following statement in the same editorial: "According to the new ideas on the subject the reduction (of tuberculosis morbidity and mortality) should be the prevention of the infection such as typhoid fever, the popularization of outdoor life and hygienic living." How outdoor life can be obtained without exposure to sunlight is a matter difficult for me to conceive. Dr. Woodruff belittles and calls orthodox the view that the freedom from tuberculosis of sanatorium attendants should be primarily due to prevention of infection, and questions that the reduction of the death rate from tuberculosis in New York City should be due to the method inaugurated by the New York City Health department, which nevertheless is held up as an example by all foreign and American authorities on tuberculosis.

That the excellent precautions taken in the disposal of the sputum in sanatoria is responsible for the freedom from tuberculosis of the employees may be orthodox but it is nevertheless true. Has Major Woodruff forgotten how many internes and nurses contracted tuberculosis in general hospitals in the olden days when the communicability of the disease was little understood and no precautions taken?

When Dr. Woodruff finally expresses his hope that I "will soon let up on the consumptive a little more," I will merely say that I have no intention whatsoever of gratifying the good doctor by giving up my life's work. I have just had the satisfaction of seeing the seventh American edition of my

prize essay "Tuberculosis as a Disease of the Masses and How to Combat It" translated into the Bohemian language. This makes the 28th translation into foreign tongues of a work intended to educate the masses concerning the prevention of the most prevalent of all diseases. In this essay all the views which Dr. Woodruff so energetically combats are set forth. Have all the many foreign governments who, upon counsel of their foremost tuberculosis scientists, ordered the translation of the essay into their respective tongues, been ill advised?

Colonel Woodruff has a colleague and sympathizer in Dr. Thomas J. Mays of Philadelphia who, in a series of articles, which appeared July 4th, July 11th, August 29th, and September 26th of this year in the *New York Medical Journal*, attacks all the modern views on prevention and cure of tuberculosis. I have replied to all the arguments with which Dr. Mays tries to defend his various theses under more or less fantastic headlines. In one of his articles he uses the sensational title "Is the Consumption Crusade Becoming a Burlesque?" My reply in the *N. Y. Medical Journal* of November 7th bears the title "Is the Modern Tuberculosis Crusade Really a Failure?" This contribution in which I have defended the modern tactics of our medical leaders and the great army of men and women from the lay world who have devoted their lives to an intelligent anti-tuberculosis crusade, will show Dr. Woodruff that I am not yet in the mood to let up. While I do not question the qualities of heart of either Dr. Woodruff or Dr. Mays, I must emphatically question the wisdom of letting these gentlemen try to undo the work of a Koch, a Brehmer, a Dettweiler, a Grancher, a Rollier, a Trudeau, a Bowditch, or a Biggs.

Dr. Woodruff, who evidently does not believe in the possibility of the disease being communicated by the careless spitter, concludes his editorial by saying: "The lot of the poor devils is hard enough already without being held up as a danger to the community if they spit. We are heart and soul with the law against spitting, for its other evils are bad enough without blaming it for things it does not do."

It is hard to perceive what Dr. Woodruff means by this phrase. Does he mean to say that the careless deposit of tubercu-

lous sputum is harmless? If he believes this it is time for him to make some experiments with the inhalation of dried and pulverized tuberculous sputum and watch the result.

To the doctor's sentimental reference to "the lot of the poor devils" let me reply just as I replied to Dr. Mays: "I can vouch for it that there is not a single one among the modern tuberculosis crusaders who is not imbued with the desire to do the best and the wisest thing, particularly for the thousands of the consumptive poor. For them and the poor who are not consumptive we are pleading to have better housing, better food, and better social conditions in general, including a living wage for men and women, abolition of child labor and over-work of all laborers. For the thousands of consumptive poor who can or should not be treated at home but need constant medical supervision, but who because of lack of institutions cannot receive the benefit of sanatorium treatment we plead to have more special hospitals and more sanatoria, and address this appeal to statesmen, municipal authorities and philanthropists alike. There should be no uncared for consumptives. This is the ambition of the modern tuberculosis crusader." And last but not least, I beg to assure Dr. Woodruff that whatever has been done and whatever we are doing in the line of prevention and in the line of cure, it has always been the aim of the workers to avoid hardships to the afflicted. Our motto is: War against tuberculosis and all conditions causing it, but never against the tuberculous patient—he is our brother, and we are our brother's keeper.

I am sure, Mr. Editor, that in fairness to me, in justice to my co-workers, and in justice to the anti-tuberculosis cause in general, you will extend to the above letter the hospitality of the columns of AMERICAN MEDICINE.

Very sincerely yours,  
S. ADOLPHUS KNOFF.

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[The statements made in the above paper as to my views on tuberculosis are not correct. Rollier's results are held up as proof of my alleged errors, but I have paid a visit to him at Leysin, Switzerland, and find that his results confirm everything I

have published on the subject. Should anyone desire to know the facts he can find them in the *N. Y. Med. Journal* of Sept. 12, 1908. A fuller description of heliotherapy will appear in my forthcoming book on Medical Ethnology.

CHAS. E. WOODRUFF.]

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## SECOND REPORT OF THE COMMITTEE IN CHARGE OF THE FUND FOR BELGIAN PHYSICIANS.

The Committee in charge of the Fund for Belgian Physicians again report progress and take this opportunity of expressing their heartfelt appreciation of the continued response to the appeal for the noble, hard working doctors of devastated Belgium. A second donation of \$250—making a total of \$950 to date—has been forwarded through the kind offices of the Reverend J. F. Stillemans, President of the original Belgian Relief Committee, to the officers of the General Medical Society of Belgium. This organization, corresponding to our American Medical Association, is in a position to employ the funds received to the best possible advantage, and without unnecessary red tape to place every dollar where it is most needed and will accomplish the greatest good.

We might wish that our Fund was larger, but it must be remembered that a great many American medical men had already, before the organization of this movement for Belgian physicians, contributed to the general or other funds to the limit of their resources. In view of this, it is surprising that our contributors have been able to do as much as they have for the physicians of Belgium. Realizing the sacrifices involved in many, many instances our hearts are full of gratitude for the spirit of co-operation that has thus been shown. Words of cheer and contributions from all over the United States and Canada have poured in on us, showing an interest in and sympathy with this project that have given us a new confidence in the kindness of our fellowmen. In a great many cases, we have been promised later contributions as our correspondents' resources permit. Not one dis-

cordant note has been heard; every letter we have received has carried hearty approval and commendation. We regret that lack of space prevents us from printing all of these communications, if for no other purpose than to show the unanimous sentiment of approbation.

The following list gives all contributions up to about the 20th inst., the date this journal has to close its last forms. In last month's list of contributors, a typographical error credited Dr. Jacquemin of Hoboken, N. J. with \$1.00 instead of \$5.00 as it should have been, and gave \$5.00 to Dr. Louis

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**BELGIAN RED CROSS WORKERS.**

A group of Belgian doctors and priests in front of a Red Cross train (that has stopped at a Belgian frontier town) on the way to the scene of action.

Doroff instead of \$1.00. After careful consideration it has been decided to repeat last month's list of contributors, and in this the last issue of the year give a full and complete statement of all contributors to Dec. 22, 1914.

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The Committee especially wish to extend their sincere thanks to the editors who have responded so nobly to the request for co-operation. Without the slightest hesitation every publication appealed to for aid has given either the assistance requested or has cheerfully agreed to do so at the first available opportunity. We have been profoundly touched, therefore, by the spirit of co-operation that has characterized the attitude of many of the country's leading medical journals. Each of the following journals has printed without charge a full page advertisement describing the movement for Belgian physicians or has cheerfully presented the proposition to its readers through its editorial pages. That such substantial assistance has helped in no little degree to insure the success of the Fund is very evident, and with grateful appreciation full acknowledgement is hereby given to our editorial colleagues who have shown a whole souled willingness to further this movement that tells in no uncertain way of their calibre as earnest, unselfish, kind-hearted men, true to their calling and their love for mankind.

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International Journal of Surgery  
Buffalo Medical Journal  
Virginia Medical Semi-Monthly  
Canadian Jour. of Med. and Surgery  
Massachusetts Med. Jour.  
Chicago Medical Recorder

There are probably other publications that have aided us that are not included in the foregoing list, and also some that have not had a chance to appear since receiving the appeal for our Belgian confreres. In subsequent issues every effort will be made by the Committee to give due credit to every journal or individual aiding this project. If any publication fails to receive proper acknowledgement it will be wholly unintentional. The Committee is too grateful to all and too conscious of the value of assistance from even the humblest source to deny or minimize a single agency.

From letters and communications received we have reason to believe that the sums already placed at the disposal of the Relief Committee of the General Medical Society of Belgium, although modest, have yet proven extremely serviceable because of their timeliness. Indeed if we are reliably informed, our contributions were almost the first placed in the hands of the Belgian medical authorities to be used exclusively for the physicians urgently needing assistance. The early receipt of these sums doubtlessly enabled them to accomplish much more than they would later when the agencies of relief have become more extensive.

In concluding this, our second report, we again thank each and every one who has responded to our appeal for the physicians of poor, bleeding Belgium. You who have denied yourselves and nobly given to the Fund will never regret your sacrifice. Could you know, as some of us do, how these Belgian doctors are working at all hours of the day and night, striving with all the power that lies in them to relieve the countless ills that afflict a people already suffering the

acme of misery from sorrow, hunger and cold, you would admire their devotion to duty. But when we realize that these men are doing their work while suffering themselves from lack of food, clothing and the bare necessities of life, we begin to get a new idea of the faithfulness and nobility of the doctors of this stricken land. Do not such men deserve special consideration from those of us who have some knowledge of the burden of physical distress they are carrying? Can we devote any resources at our command to a finer purpose than to a concerted effort to lighten this burden?

A few days ago a gentleman called at the office of the Belgian Medical Fund to leave a contribution from himself and also one from his daughter. Kindly and sympathetic in his manner, a few words told plainly that this movement for the doctors of Belgium appealed to his judgment as well as to his charitable inclinations. "In thinking over the matter," he said, "we came to the conclusion that we could not give a more effective contribution than to the doctors. In a way, it will be like giving twice, for in aiding the physicians we will enable them to do more for those who need their services." There spoke the New England spirit of thrift, but was it not admirable in its sound common sense?

Verily, in giving to the physicians of this sorely afflicted nation we will be giving twice, and maybe many times over. The Belgian people are in grave need of medical care and skill, and anything that will increase the efficiency of their medical attendants, essentially raises the character of the services that will be rendered.

Friends and colleagues, we ask you to join us therefore, during the next few months in building up this Fund for our Belgian confreres, not alone that we may relieve their distress and suffering but what may be quite as necessary, in order that our afflicted brethren may render better and more efficient service to those who so urgently require their ministrations.

We do not ask for much from each one. One dollar a month from one thousand individuals and devoted to the doctors of Belgium would mean more than can be estimated to the sick and sorrow laden people of this unhappy country.

In closing this report we earnestly hope that all who read it will realize that we must continue our labors for some time. If you

have not contributed, send in something soon, *if it is only a quarter!* Furthermore why not organize a small committee in your community and collect what you can from your friends? Two, three or four dollars made up of dimes, quarters and halves will help our Fund to a substantial degree.

Remember, our Belgian brothers may be relieved for the moment, but they are still in urgent need. Let us keep up the work we have so well started.

Respectfully submitted,

H. EDWIN LEWIS,

For the Committee in Charge of the American Fund for Belgian Physicians.



**Implantation of the Generative Glands and its Therapeutic Possibilities.**—The following are the conclusions of Dr. G. Frank Lydston, of Chicago, in his remarkable study of the results of defective internal secretion of the sexual glands and the cure of such cases by transplantation, (*New York Med. Jour.*, Oct. 17, 1914).

1. At least temporarily, probably permanent—ly—and indubitably therapeutically—successful total or partial implantation of human sex glands in both male and female is practicable.

2. Glands taken from the living subject are most desirable, though rarely obtainable. The closer the blood relationship of donor and recipient the better, but such relationship is not necessary for purely therapeutic purposes.

3. Judging by my own autoexperiments and heteroexperiments, and with due respect to Carrel's observations, I conclude that, while glands frozen before decomposition may be available, they must be used without freezing and very promptly after removal from the body, to obtain a fair average of successes. Glands taken from the healthy dead body at any time prior to the beginning of decomposition are of therapeutic value equal to that of those taken *in vivo*, if implantation succeeds. Portions of glands are to a certain degree therapeutically serviceable, according to conditions and dose.

4. Where we are not warranted in incurring risk, the subject from which the glands are taken should be selected with extreme care.

5. The ovary and the testis probably are alike in their susceptibility to implantation, both from the living to the living and from the dead to the living. If any difference exists, it seemingly is in favor of the ovary. In human beings, the gland of one sex is trans-

plantable upon the other, and it is possible that the hormone of the one is useful to the other. My experiments apparently show that the tissues of the female are more hospitable to the implanted male sex glands than are the tissues of the male.

6. The benefits of implantation probably accrue irrespective of the site of the implantation, but the vicinity of the peritoneum (extraabdominal) in the female, and of the tunica vaginalis in the male, are the sites of election.

7. The internal sex gland secretion is stimulant, nutrient, tonic, and reconstructive, and should increase resistance to disease. Certain chronic infections, notably tuberculosis, serious, anemia, neurasthenia, and conditions of profound debility should be benefited by implantation.

8. The development of senility possibly can be retarded and longevity increased by internal sex secretion derived from implantation. The climacteric may be postponed by it, or the disagreeable features of the climacteric relieved.

9. Used at a very early period in the disease, internal sex secretion should theoretically be the logical remedy for dementia praecox and allied conditions.

10. The internal sex gland secretion via implantation, has a very useful field in the treatment of impotence in the male.

11. Implantation, with or without anastomosis in the male, possibly may have a certain range of usefulness in sterility in both sexes.

12. Defective and aberrant psychical or physical sex development and differentiation—inversions and perversions—are definite indications for sex gland implantation. Certain cases of cryptorchidism and imperfect testicular development are an especially promising field for it.

13. Chronic diseases of the skin due to, or modified by nutritional disturbances—notably certain types of chronic eczema, psoriasis, and ichthyosis—in a certain proportion of cases apparently are likely to be benefited, and possibly cured by sex gland implantation.

14. That arteriosclerosis will in its early stages be benefited by sex gland implantation is probable. Inferentially, if taken early, senile dementia possibly may show beneficial results.

15. All conditions incidental to sex gland mutilations in either sex afford a positive indication for sex gland implantation, the probability of benefit being inversely as the length of time that has elapsed since the mutilation, and dependent on the age at which it occurred.

16. The most important point of all is that, in properly selected cases, successful implantation ought inevitably to increase physiological efficiency, with all the benefits accruing therefrom. With increased physiological efficiency come individual and social efficiency.

17. Opportunities should be sought in the human subject for histological study of implanted glands at varying periods after implantation, to determine in what degree both generative and internal secretion gland tissues endure.

18. Every effort should be made so to amend our laws that viable tissues of all kinds, notably internal secretory glands, shall become avail-

able to science. To this end the public especially should be made to understand that the sacrifice of a portion of thyroid or of a single ovary or testis by a living subject is not disastrous. The author believes that possibly there are times when such a sacrifice would restore reason, perhaps even save life. Legislation and public sentiment should favor scientific research. Between the antivivisectionists, on the one hand, and popular reverence for the dead human body, on the other, we are in sore straits. Why should there be a waste of material which, if properly used, possibly might add so much to the health, happiness, efficiency, and even to the longevity of the human race? Let us strive for the conservation of biological energy.

As matters now stand, only persons in affluent circumstances, and very few even of these, and a limited number of the poor in our institutions can avail themselves of sex gland implantation.

**Simple Method for Quantitative Determination of Glucose.**—A. F. Dimmock (*British Med. Jour.*, Aug. 29, 1914) gives his simplified method in the following words: The urine is diluted twenty times, that is, ten c. c. of urine is measured and poured into a 200 c. c. flask; this is made up to the 200 c. c. mark, and the whole well shaken. A solution of potassium carbonate, two ounces to six ounces of distilled water, is filtered and made up to eight ounces. To twenty c. c. of the diluted urine ten c. c. of the potassium carbonate solution are added in a small flask, boiled carefully for three minutes, and when cool made up to a definite amount, say fifty or 100 c. c. with distilled water. In order to estimate the amount of sugar present a solution of pure glucose is prepared, one gram in 200 c. c. of distilled water; twenty c. c. of this and ten of the potassium carbonate solution are boiled together in a small flask for three minutes, and when cool made up to fifty c. c. or 100 c. c. The two solutions are then compared by holding the glass tubes over a piece of white paper at an angle of forty-five degrees. By pouring the liquid from the known solution into a measure glass until the tints of both are alike, and observing the amount of the known glucose solution used, the percentage can be readily determined. For example, if twenty-seven c. c. of the pure glucose solution was required for the solution, then, multiplying by two, we obtain .4 as the percentage of glucose in the urine. It is the hope of the author that it will be possible to prepare a colored glass test object for comparison with the unknown urine. Of course it is necessary to remove the albumin from the urine by the heat and acetic acid before the test is made. The urinary pigments seem to have no effect, but these could be removed easily by precipitation with lead acetate and filtration.

Department of Agriculture has issued the following bulletin concerning the foot and mouth disease that is now prevailing so extensively among the cattle in the central western United States. All material coming from the Office of Information is of value, but the following is particularly timely and valuable.

The anxiety that has been expressed in several quarters in regard to the effect upon human health of the present outbreak of the foot and mouth disease is regarded by government authorities as somewhat exaggerated. The most common fear is that the milk supply might become contaminated, but in view of the precautions that the local authorities in the infected areas are very generally taking, there is comparatively little danger of this. Milk from infected farms is not permitted to be shipped at all. The only danger is, therefore, that before the disease has manifested itself some infected milk might reach the market. For this reason, experts in the United States Department of Agriculture recommend pasteurization. As a matter of fact, however, pasteurization is recommended by the department anyway for all milk that is not very high grade and from tuberculin tested cows.

It has been demonstrated by experiments which have been made in Denmark and Germany that pasteurization will serve as a safeguard against contagion from the foot and mouth disease just as readily as it does against typhoid fever, but in any event it must be thoroughly done—the milk must be heated to 145 degree Fahrenheit and held at this temperature for thirty minutes.

In this country the foot and mouth disease has been so rare that there are few recorded cases of its transmission to human beings. In 1902 a few cases were reported in New England, and in 1908 in a few instances eruptions were found in the mouths of children which were believed to have been caused by contaminated milk. In both of these outbreaks, the sale of milk was stopped as soon as the disease was found among the cattle. As long, therefore, as the disease can be confined by rigid quarantine to certain specified areas, the danger from this source is very small. Should the pestilence spread all over this country and become as general as it has been at various times in large areas of Europe, the problem would become more serious. Under any circumstances, however, pasteurization would be an efficient remedy. When pasteurization is not possible, and where there is any reason to suspect that the disease may exist, the precaution of boiling milk might be advisable.

Cows affected with the malignant form of the disease lose practically all of their milk. In mild cases, however, the decrease may be from one-third to one-half of the usual yield. The appearance of the milk also changes. It becomes thinner, bluish, and poor in fat. When the udder is affected, the milk frequently contains coagulated fibrin and blood, so that a considerable sediment forms, while the cream is thin and of a dirty color. These changes, however, occur only when the disease is in an advanced stage, and, as a matter of fact, the

disease is not permitted to pass into an advanced stage, as any stricken animal is at once slaughtered.

Men who come in contact with diseased animals may also become infected. In adult human beings the contagion causes such symptoms as sore mouths, painful swallowing, fever, and occasional eruptions on the hands, finger tips, disease is rarely serious. Where it is very prevalent among animals, some authorities believe that it is fairly general among human beings, but that the disturbances it causes are usually so slight that they are not brought to the attention of the family physician. There is, however, a very good reason for everyone giving the diseased animals as wide a berth as possible, namely, that otherwise they may easily carry the disease to perfectly healthy herds. Federal inspectors engaged in the work of eradicating the pestilence are thoroughly equipped with rubber coats, hats, boots and gloves, which may be completely disinfected; and others who lack this equipment are strongly urged not to allow their curiosity to induce them to become a menace to their own and their neighbor's property.

The disease, in short, is dangerous because of the loss that it occasions to property, and not because of its effects upon the health of mankind. At present all infected herds are being slaughtered as soon as they are discovered, the carcasses buried, and the premises thoroughly disinfected. Until all danger of infection has been removed in this way, the local authorities quarantine the milk.

Those who wish additional precautions are recommended to use pasteurized milk, but as has already been said, this recommendation holds true whether or not there is any fear of the foot and mouth disease.



**The Practical Treatment of Drug Addiction.**—The following treatment has been followed in the City Prison without the occurrence of a single death, says Lichtenstein (*New York Med. Jour.*, Nov. 14, 1914). "Upon admission, a history is taken, a physical examination and a sputum examination are made for tubercle. The period of addiction, amount taken daily, reasons for taking the drug, and the kind of drug taken are ascertained. If an individual is very weak, he receives two one sixth grain morphine tablets. Individuals having a pulse of 120, receive two morphine tablets, each grain one sixth. Individuals with an irregular pulse receive two one sixth grain morphine tablets. Those well nourished, with a pulse between eighty and 100, receive one one sixth grain morphine tablet and one one sixtieth grain strychnine tablet. Those with pulse between

100 and 120, not well nourished, receive morphine grain one sixth and strychnine grain one thirtieth. The foregoing is the first daily dose. In addition to the medicine administered, each prisoner is allowed three compound cathartic pills. No further cathartic is administered for at least three days. This saves the strength of the patient and is not accompanied in any case by deleterious results. The second day, the heart is examined and the pulse taken. All withdrawal symptoms are noted. The same dose is given as the day before and repeated for about three days. At the end of three days, those who had received two morphine tablets now receive one one sixth grain morphine and one one sixtieth grain strychnine tablet. Those who had received one one sixth grain morphine and one one sixtieth grain strychnine tablets, now receive two one sixtieth grain strychnine tablets. The weakened individuals, in addition, receive the prison tonic (Doctor McGuire's prescription), which consists of:

R. Tincturæ nucis vomice....}      Acid. hydrochloridi diluti. } ...æ 7.0;  
Elixirs simplicis .....q. s. ad. 60.0  
M. et Sig.: One teaspoonful three times a day.

By the end of the week all morphine and heroine fiends, regardless of the period of addiction, are receiving strychnine, grain one thirtieth, once a day. This drug is continued for five days, and then the withdrawal is complete. Such prisoners should now be sent away to a farm for at least one year in order to make the cure complete.

The prisoners never know that they are receiving strychnine instead of morphine. The tablets look alike and taste alike. I have seen fiends take a strychnine tablet and go right to sleep, believing they had the real drug. It may be seen, therefore, that most of the symptoms complained of are imaginary, and that it is really possible for these people to get along on a very much smaller amount of the drug than they have been accustomed to.

In beginning the treatment, none of the prisoners has a desire for food. In about five days the appetite has improved, and at the end of the week the appetite may be said to be voracious. I have never seen people eat more heartily than habitués when they are almost off the drug, having taken the above mentioned treatment. As soon as they begin to eat well, prisoners may be said to be three quarters cured.

#### SYMPTOMATIC TREATMENT.

**Insomnia.** This symptom is treated by the administration of a mixture consisting of chloral and sodium and potassium bromide. If this proves insufficient, sulphonal, grains fifteen, is administered.

**Vomiting.** The administration of rhubarb and soda, drams two, is sometimes efficacious. If this does not prove successful, then *mistura contra diarrheam*, minimis ten, in water is administered. The latter usually answers the purpose; in case the vomiting does not cease after its administration, a hot water bag is applied to the abdomen and a hypodermic injection of a small dose of morphine is given.

**Abdominal pains.** It is astonishing to note how often a "fake" pill, strychnine sulphate, grain one sixtieth, will answer the purpose. If this does not relieve the patient, a hot water bag is applied.

**Precordial distress.** Strychnine sulphate, grain one sixtieth to one thirtieth, always relieves this symptom.

The above mentioned symptoms are the only ones which require treatment. The general treatment administered to patients for curing the habit usually anticipates other symptoms."

**Liquid Petrolatum as a Laxative.**—Liquid petrolatum has been extensively employed as a laxative, according to W. T. Bastedo (*Journal of the American Medical Association*, Aug. 29, 1914) since it was called to the notice of the profession by Sir Arbuthnot Lane. It is a viscous liquid that is not at all changed chemically and not at all absorbed from the alimentary tract, as shown by Bradley, 1911, and by Bloor, 1913, hence it serves to soften and to increase the bulk of the feces. It is also believed to be strictly non-irritant. Whether or not it exerts in the bowel a disinfectant effect on some of the strains of fecal bacteria has not been demonstrated. Finch and others have shown that it lacks disinfectant effect, but that, by virtue of its viscous and oily nature, it acts as an agent which retards the growth of bacteria implanted in it, but this does not serve as a test of its antibacterial value when mixed with food residue in the ileum or colon.

The refined oil is almost tasteless, is readily swallowed without any added flavor, and in doses of from 1 to 3 ounces a day is a mild but often efficient laxative. On account of its oily nature, it should not be taken just after meals, but preferably when the stomach is empty, that is, about an hour before lunch and dinner and at bedtime, for the oil will retard gastric digestion and prolong the emptying time of the stomach. In some cases, especially those in which the stomach-emptying is already retarded, the oil is not well tolerated, causes nausea or regurgitation, and has to be stopped. In others of the chronically constipated, the oil leaks from the anus so that it greases the clothes, yet without giving a proper stool; or it passes down as free oil without admixture with the food residue. In these cases reduction of the dose of oil and persistence in its use may meet with the desired result, but a small dose of another laxative, such as cascara, may be necessary.

On account of its recent extensive use as an internal remedy, a few words in regard to the quality and properties of this oil may be in order. It is quite generally asserted that the Russian oil is superior to the American for two reasons: (1) the absence of the harder paraffins, and (2) the absence of members of the olefin series of unsaturated hydrocarbons. But in the best American oils the paraffins are removed by chilling, and according to Sir Boerton Redwood, in his extensive work on petroleum, there is no sufficient evidence that the unsaturated hydrocarbons of Pennsylvania pe-

troleum are olefins, and that, in any case, if there are any present they are readily removable by strong sulphuric acid. Redwood further states that "comparison of results obtained with American, Galician and Russian petroleum shows that the same classes of hydrocarbons—the paraffins, the polymethylenes or naphthalenes, and the aromatic hydrocarbons—are present in the petroleum from all three sources, but that the relative amount of naphthalenes and in all probability of aromatic hydrocarbons is greatest in Russian and least in American petroleum." Marcusson claims that, of stable saturated hydrocarbons which react with fuming nitric acid, the Russian oils contain a higher percentage than the American oils. There is obviously some difference between the Russian and American oils, but in the well-refined products the difference is not marked.

As a matter of fact, after a certain fraction of petroleum of the specific gravity desired has been obtained by repeated fractional distillations, the regular process of refining is to subject it to the action of strong sulphuric acid, then caustic alkali, and then water for thorough washing. A stream of dry air carries off the water. In some instances the oil is filtered through diatomaceous earth or bone-black. This refining process must be repeated many times, indeed as often as fifteen or sixteen times, perhaps, and it correspondingly increases the expense of production.

The proposed text for the Ninth Revision of the U. S. Pharmacopœia describes "liquid paraffin" as free from fluorescence, without odor or taste, and not acted on or colored by concentrated sulphuric acid or nitric acid in the cold. The British Pharmacopœia specifies that when the oil is mixed with an equal volume of sulphuric acid in a test-tube and placed in boiling water for ten minutes with frequent agitation, the color of the separated layer of acid should not be of a deeper tint than pale brown.

I have tested a number of oils on the market. Of nine samples which have been mixed with an equal volume of sulphuric acid, a portion not having been heated, and a portion having been heated on a water-bath for ten minutes, nearly all fail to come up to the requirements. Three of these samples are American and are fluorescent. The others are sold as Russian oil. Obviously the oils on the market are of very poor quality.

We do not yet know whether, when used internally, an oil is or is not harmful if it is not fully refined; but till we do know, it is the part of wisdom to demand only the very best.

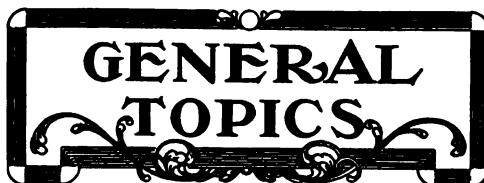
In regard to the specific gravity of these oils, it would seem that the more viscous oils, those of specific gravity from 0.880 to 0.890, are the ones of choice. I have been of the belief that lighter oils than this were likely to pass through the bowel without satisfactory admixture with the feces; but in a study of this subject, I find that there is no rule about it, and that at times in certain patients, the heavier oils as well as the lighter will give a stool of pure oil or will leak from the anus. The question of the requirement of a high specific gravity must, therefore, remain an open one.

**The Treatment of Felon or Whitlow.**—For the treatment of whitlow B. Robinson (*New York Med. Journ.*, June 27, 1914.) recommends the use of equal parts of glycerin and a saturated solution of magnesium sulphate. Aseptic gauze should be saturated with this mixture, then covered with thin rubber tissue and a little absorbent cotton, and held in place on the finger with a narrow gauze bandage. During the day this application may be removed advantageously for a while, and the finger soaked in hot water and borax (half an ounce of borax to one pint of hot water) at least during fifteen to twenty minutes, two or three times in twenty-four hours. The borated solution is very useful in reducing local pain and redness, and probably limits the spread of the disease. Prior to its employment the author used a half saturated solution of boric acid in water, with very poor results. When the felon is well on towards recovery, after several weeks of wet dressing and soaking, oxide of zinc ointment applied at bedtime or during the day also, is notably beneficial in curing what still remains, although slight, of pain, redness, and swelling.

**Palatable Epsom Salt.**—The following formula is taken from the *Northwestern Druggist* as representing a palatable form of administering magnesium sulphate:

Magnesium sulphate .....	1 ounce.
Solution of saccharin .....	1 dram.
Oil of peppermint .....	2 drops.
Oil of anise .....	2 drops.
Water—enough to make .....	2 ounces.

Dissolve the sulphate in water, add the other ingredients, then filter.



**Red Cross Seals.**—The National Association of the Study and Prevention of Tuberculosis sends out the following information in regard to the steady increase in the sale of the Red Cross Christmas seals.

More than 44,000,000 of these seals were sold last December. In this way \$440,000 was netted for anti-tuberculosis work in various parts of the United States.

The sale in 1913 is a gain of 4,000,000 seals over 1912, or 10 per cent.

New York State led the country last year with a sale of over 10,500,000 seals, or one for each man, woman and child in the State. Of this number, more than 6,825,000 were sold outside of New York city. Ohio came next, with a sale of 2,800,000, Wisconsin third, with 2,700,000, and Illinois fourth, with 2,500,000. Hawaii

sold the most seals per capita, the total sale being somewhat over two for each inhabitant. Rhode Island came second, with a sale of two per person.

Beginning with a sale of 13,500,000 in 1908, in six seasons the revenue which these little holiday seals have brought to the anti-tuberculosis campaign has more than tripled, an aggregate for the period of over \$1,800,000 or 180,000,000 seals.

The seal design for 1914 has been selected and orders for the printing of 100,000,000 seals have been placed. Plans for the organization of a larger sale this year than ever before have been perfected.

**Centenarians Few in Numbers.**—According to census reports, (*Medical Summary*, Nov., 1914) centenarians are a good deal like the snakes of Ireland—very scarce. The United States, with a population of more than ninety millions, is given credit for only 46. Germany's population is 60,000,000—or was before the war—and its quota of centenarians is, according to census, 70. Great Britain, with a population of 46,000,000, has 94. France, with 40,000,000, claims 164. Bulgaria, with 4,000,000 inhabitants, boasts of 3,300 and Roumania with 6,000,000 people, has 3,320 centenarians. The last named little countries eat little meat and drink a great deal of sour milk. The buttermilk propagandists attribute the much greater longevity in Bulgaria and Roumania to the popularity of the sour milk diet.

**Notes on the Medical and Surgical Aspects of the Present War.**—Col. G. H. Makins of the British Army Medical Service writes (*Lancet*, Oct. 24, 1914) of the wound problems met in the present great war and says that in the field the more serious complication of tetanus has become far less common in concurrence with the less seriously septic state of the wounds. It is still too early to form any opinion as to the success of the prophylactic measures which have been resorted to, but much is to be hoped for from them, and possibly a still greater advantage may be gained from the removal of our troops from a district in which tetanus is notoriously common amongst the civil population in time of peace.

The methods of treatment which have been adopted have ranged over the whole area of past experience, the only routine plan having been the injection of antitetanic serum in large doses. At the Pasteur Institute, where two cures have been obtained, serum treatment by subcutaneous injection was the main element; at other hospitals the serum has sometimes been administered intravenously or by the intrathecal route. Beyond this, in some cases 20 per cent. peroxide of hydrogen solution has been injected subcutaneously and oxygen inhalations have been tried, while in all peroxide of hydrogen has been employed locally to the wound. Subcutaneous injections of magnesium sul-

phate have been tried to control spasm. Especially Angers subcutaneous injections of 2 per cent. carbolic acid have been the favorite treatment, as much as 22 grains being administered per diem without any unpleasant results. Both in the English and French hospitals there this method was regarded with much confidence, and at No. 5 General Hospital I was shown two cases upon the high road to recovery treated by this method in combination with serum. In a large majority of all the cases chloral has been given by mouth or by rectum in large doses, and chloroform inhalations have been resorted to for severe and painful spasm.

In spite of this very varied treatment the main factor in the prognosis has, as in the past experience, proved to lie in the length of the incubation period. Few if any cases have recovered where symptoms developed before the tenth day following the wound. Of some ten cases promising recovery which have come under my own observation the incubation period varied from 10 to 15 days. The type of disease has been somewhat variable, the only constant features being the "facies" and trismus. In the most acute cases general spasm was not infrequently absent, but in these the intense general septicemia no doubt overshadowed the purely tetanic signs. In many cases local spasm of the affected limb, often extremely painful, has been a marked character.

Local surgical measures have been little employed; the wounds have been too large for excision, and in the few instances in which amputation of a limb has been resorted to no favorable result has been attained. The same may be said about the method favored by some of the French surgeons of dividing the great sciatic nerve when the leg or foot was the seat of injury.

With regard to any special characteristics of the local injuries not much remains to be said. The common lodgment of fragments of shells is naturally a marked feature, also the very large area of laceration within when the wound of entry is comparatively small, suggesting a revolution of the missile within the limb continued after the moment of impact. I have twice seen the iron wad of a shrapnel shell which had been removed, once from the leg, and once from the buttock, in either case the missile having entered edgeways by a very moderate-sized slit wound. Retained pointed bullets are far from uncommon, and, as has been before remarked, contour wounds, especially around the chest wall, are often seen. Wounds of the head seen in the hospitals are of the tangential type in a very great preponderance; those traversing the skull are comparatively rare. This is no doubt to be explained by the frequency with which the injuries are caused by shrapnel bullets travelling with low velocity. The depressed fragments produced by the shrapnel bullets are of a larger size than those resulting from blows from rifle bullets of small calibre. There seems little doubt that the injuries produced by the English bullet are more severe as a rule than those resulting from the German. It may be that

this is partly due to a lower velocity of flight in the case of bullets fired from machine guns, which are so freely used by the German army. Either bullet, however, when striking with high velocity is prone to fragmentation. Trephining of the skull performed for local pressure symptoms has as a rule been followed by very gratifying results, more or less complete recovery from paralysis occurring in many cases, showing that the area of destruction is not necessarily great. The spinal injuries are as usual of a depressing character, but where paraplegia has resulted from shrapnel wounds not actually impinging on the spinal canal recovery seems more rapid than in the case of similar signs accompanying wounds by bullets of small calibre. Signs of union are evident in a considerable proportion of the compound fractures.

**The Massachusetts Society for Mental Hygiene.**—The Massachusetts Society for Mental Hygiene has opened an office at Room 313, Ford Building 15 Ashburton Place, Boston. The officers of the society are: The Honorable Harvey H. Baker, Boston, president; Doctor Walter E. Fernald, Waverly, vice-president; Doctor Charles E. Thompson, Gardner, secretary; John Koren, Esquire, Boston, treasurer; executive committee, Miss Edith M. Burleigh, Boston; Doctor James J. Putnam, Boston; Doctor Alfred E. P. Rockwell, Worcester; Doctor Henry R. Stedman, Brookline; Professor Robert M. Yerkes, Cambridge. Doctor Frankwood E. Williams, formerly resident physician at the Psychopathic Hospital, Ann Arbor, Michigan, and first assistant physician at the Psychopathic Hospital, Boston, has been appointed executive secretary.

**More Translations of Dr. Knopf's Prize Essay.**—The seventh American edition of Dr. S. A. Knopf's prize essay "Tuberculosis as a Disease of the Masses and How to Combat It," has been translated into Bohemian by Dr. S. Breitenfeld of New York. This translation appeared first in serial form in the Bohemian Daily "New Yorske Listy," and has now been printed in book form by the publishers of this paper who are located on Second Avenue between 71st and 72nd streets, New York. The book is especially intended for the many Bohemian colonies throughout the United States.

The same latest American edition is now being translated into Spanish by Dr. Jesus E. Monjaras of Mexico City, which makes the third edition in Spanish, two having appeared in previous years.

Dr. A. Lankester, the Government appointee of the Indian Research Fund Association (special tuberculosis enquiry), Cranleigh, Simla, is now translating the essay into a second East India dialect—one Hindi edition having appeared last year. This makes the 30th translation of the essay since its original appearance in German some ten years ago.

# AMERICAN MEDICINE

PUBLISHED MONTHLY

Editorial Offices: 18 East 41st St., New York City

Publication Offices: 189 College St., Burlington, Vt.

Complete Series, Vol. XX. No. 12  
New Series - Vol. IX. No. 12

DECEMBER, 1914

\$1.00 YEARLY  
in Advance

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Entered as second-class matter January 28, 1908, at the P. O. at Burlington, Vt., under the Act of Congress, Mar. 3, 1879.



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